



EDITED BY

PETER R.  
ANSTEY

≡ The Oxford Handbook of  
BRITISH PHILOSOPHY IN  
THE SEVENTEENTH CENTURY

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## List of Abbreviations

AR	Aristotle (1984). <i>The Complete Works of Aristotle</i> , 2 vols, ed. J. Barnes. Princeton: Princeton University Press.
AT	Descartes, René (1996). <i>Oeuvres de Descartes</i> , 11 vols, ed. C. Adam and P. Tannery. Paris: Vrin.
B	Boyle, Robert (1999–2000). <i>The Works of Robert Boyle</i> , 14 vols, eds. M. Hunter and E.B. Davis. London: Pickering and Chatto.
BOA	Boyle, Robert (2005). <i>Boyle on Atheism</i> , ed. J.J. MacIntosh. Toronto: University of Toronto Press.
BP	Royal Society Boyle Papers.
CSM	Descartes, René (1984–1985). <i>The Philosophical Writings of Descartes</i> , 2 vols, ed. and trans. J. Cottingham, R. Stoothoff, and D. Murdoch. Cambridge: Cambridge University Press.
CSMK	Descartes, René (1991). <i>The Philosophical Writings of Descartes</i> , vol. 3, ed. and trans. J. Cottingham, R. Stoothoff, D. Murdoch, and A. Kenny. Cambridge: Cambridge University Press.
DCo	Hobbes, Thomas. <i>Concerning Body (De corpore)</i> , in <i>English Works of Thomas Hobbes</i> , 11 vols, ed. W. Molesworth (1839–1845), vol. 1 [first edition London, 1655, in Latin].
EIM	Cudworth, Ralph (1996). <i>A Treatise Concerning Eternal and Immutable Morality, With a Treatise of Freewill</i> , ed. S. Hutton. Cambridge: Cambridge University Press [first edition London, 1731].
Essay	Locke, John (1975). <i>An Essay concerning Human Understanding</i> , ed. P.H. Nidditch. Oxford: Clarendon Press, [fourth edition London, 1700]. NB. Specific editions of the <i>Essay</i> are referred to by subscript, e.g. <i>Essay</i> <sub>2–5</sub>
EW	Hobbes, Thomas (1839–1845). <i>The English Works of Thomas Hobbes</i> , 11 vols, ed. W. Molesworth. London.
JBP	Grotius, Hugo (1993). <i>De jure belli ac pacis</i> , ed. B.J.A. de Kanter-van Hettinga Tromp et al., revised edition Scientia: Aalen [first edition Paris, 1625]. (p. ix)
LEP	Hooker, Richard (1989). <i>Of the Laws of Ecclesiastical Polity. Preface, Book I, Book VIII</i> , ed. A.S. McGrade. Cambridge: Cambridge University Press.
Lev.	Hobbes, Thomas (1996). <i>Leviathan</i> , ed. R. Tuck. Cambridge: Cambridge University Press [first edition London, 1651].
MS	Manuscript.
OED	Oxford English Dictionary.

OFB	Bacon, Francis (1996–). <i>The Oxford Francis Bacon</i> , 15 vols, ed. G. Rees et al. Oxford: Clarendon Press.
OL	Hobbes, Thomas (1839–1845). <i>Thomæ Hobbes Malmesburiensis opera philosophica quae latine scripsit omnia</i> , 5 vols, ed. W. Molesworth. London.
<i>Principia</i>	Newton, Isaac (1999). <i>The Principia. Mathematical Principles of Natural Philosophy</i> , trans. I.B. Cohen and A. Whitman. Berkeley and Los Angeles: University of California Press [third edition London, 1726].
S	Boyle, Robert (1991). <i>Selected Philosophical Papers of Robert Boyle</i> , ed. M.A. Stewart. Indianapolis: Hackett.
SEH	Bacon, Francis (1857–1874). <i>The Works of Francis Bacon</i> , 14 vols, ed. J. Spedding, R. Ellis, and D.D. Heath. London.
TIS	Cudworth, Ralph (1678). <i>The True Intellectual System of the Universe</i> . London.
TLN	Cumberland, Richard (2005). <i>A Treatise of the Laws of Nature</i> , ed. J. Parkin. Indianapolis: Liberty Fund [ <i>De legibus naturae disquisitio philosophica</i> , trans. J. Maxwell. London, 1727. Latin edition London, 1672].
TNA	The National Archives, Kew.
TT	Locke, John (1970). <i>Two Treatises of Government</i> , ed. P. Laslett, second edition Cambridge: Cambridge University Press [first edition London, 1690].

# Notes on Contributors

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## Introduction

Peter R. Anstey

The Oxford Handbook of British Philosophy in the Seventeenth Century

*Edited by Peter R. Anstey*

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## Abstract and Keywords

This introductory chapter discusses the theme of this book, which is about the state, nature, and practices related to British philosophy in the seventeenth century. The book is divided into five parts dealing with the philosophy of nature, the study of knowledge and human understanding, moral philosophy, political philosophy, and the works of leading seventeenth-century philosophers, including Francis Bacon, Robert Boyle, Isaac Newton, and Thomas Hobbes. The chapter also discusses key developments in modern philosophy during this period, which include heightened historiographical awareness and the reassessment of the philosophical canon.

Keywords: British philosophy, philosophy of nature, study of knowledge, human understanding, moral philosophy, political philosophy, Francis Bacon, Robert Boyle, Isaac Newton, Thomas Hobbes

THIS *Oxford Handbook* consists of twenty-six substantial new essays by leading experts on early modern British philosophy. It aims to give both advanced students and scholars a comprehensive overview of the current issues that are informing research in the field. The volume is broad in scope and far reaching in impact. In addition to providing a review of the latest research in the subject, it aims to carry the debate forward in the interpretation of leading philosophical texts and arguments.

The discipline of the study of early modern philosophy has made great progress in recent decades. Standards of research in the field have improved enormously such that virtually all scholars and students of the subject are now aware of the rich interconnectedness of the individual philosophers, the contexts in which philosophy was taught and written, and the philosophical disputes and movements that developed across Western Europe during the seventeenth and eighteenth centuries. It is natural, therefore, to ask for some justification of a volume that deals exclusively with *seventeenth-century British philosophy*.

More than any other region of early modern Europe, developments within philosophy in the British Isles can be fairly neatly partitioned by the terminus of the sixteenth century and the opening of the eighteenth. If, for example, we take the leading philosophers, there were none in the final decades of the sixteenth century. Francis Bacon's philosophical imprint began in earnest in the first decade of the seventeenth century, Hobbes flourished mid-century, and Locke rose to prominence in the 1690s and died in 1704. If we take landmark publications in natural philosophy, the first is William Gilbert's *De magnete* which appeared in 1600, Robert Boyle's *Spring of the Air* appeared in 1660, and Isaac Newton's *Principia* in (p. 2) 1687 and his *Opticks* in 1704. If we turn to the major developments in theories of property, government, and toleration, we find that the seminal British contributions fall within the decades of the seventeenth century. So, while the history of thought does not come in discrete packages, it is entirely natural, at least when studying the history of British philosophy, to confine

ourselves to the seventeenth century. Nevertheless it has to be admitted that the term ‘British’ as used in this *Handbook* is somewhat anachronistic. It is used loosely and without political connotations to refer to the English-speaking region of Western Europe, namely England, Wales, Scotland, and Ireland. British philosophers, then, are those philosophers whose vernacular was English and who spent most of their lives in the English-speaking region of Europe.

One development in the study of early modern philosophy in recent years has been a wider appreciation of the different and somewhat fluid nature of the disciplinary boundaries that prevailed in the seventeenth century. This applies both to divisions within philosophy itself and to the relation between philosophy and other disciplines. Seventeenth-century British universities did not house philosophy departments as we know them today. Indeed, much of the most important philosophy produced in Britain in this period was written outside of the university context. The fundamental division in philosophy was between natural philosophy (the philosophy of nature) and moral philosophy, with metaphysics and logic as sub-disciplines. And during the period there was ongoing discussion about the relation between, say, natural philosophy and medicine, as well as the status of mathematics (see Chapter 6). At the beginning of the century there were no Chairs in natural or moral philosophy in either Oxford or Cambridge and when the Sedleian Chair of Natural Philosophy was established at Oxford it tended to be held by eminent physicians, such as Thomas Willis. Being a philosopher in seventeenth-century Britain was a decidedly different experience to what it is today (see Chapter 1).

The fluidity of disciplinary boundaries in this period reflects the fact that in philosophy, as in many other disciplines, the seventeenth century was a period of significant change. One consequence of this is that it is difficult precisely to delineate the contours of the discipline. Indeed, it is safe to say that there is no definitive way to carve up British philosophy of the seventeenth century. For example, Part II of this volume concerns natural philosophers and the study of nature and Part III concerns knowledge and human *intellectus* or understanding. But for much of the century, the study of the understanding was considered to be a part of natural philosophy and one might argue that some of the third part of the volume should be folded into the second part.

Yet there are grounds for claiming that at least from the time of Locke’s *Essay concerning Human Understanding* (1690), the study of the understanding came to have a slightly more ambiguous status. For, much of Locke’s *Essay* is concerned with his theory of ideas (see Chapter 14) and with knowledge, reasoning, and belief, (p. 3) and in its time the work was closely aligned, not with natural philosophy, but with logic (Chapter 16). Moreover, Locke’s *Essay* is also concerned with that other faculty of the mind, namely the will, and therefore the book is concerned to some degree with moral philosophy as well (see Chapter 17). Thus, while Locke’s study of the understanding was ostensibly carried out using the method of the new experimental natural philosophy, it intersected closely with non-natural philosophical disciplines (see Chapter 13).

Interestingly, the study of the understanding was allied to the study of the mind or soul and on this subject there is a striking parallel between the preoccupations of early modern British philosophers and contemporary philosophy of mind. The early moderns were intensely interested in the relation between the soul and what we now call neurophysiology, including theories of memory and animal spirits (Chapter 12). This preoccupation has some strong parallels with the importance of cognitive science to the philosophy of mind today.

A second development within the discipline of the study of early modern philosophy is the heightened historiographical awareness that has emerged in recent years. For much of the twentieth century, the Kantian distinction between rationalism and empiricism provided the dominant terms of reference by which early modern philosophy was understood. Readers of this *Handbook*, however, may be surprised to find how few references it contains to ‘the rationalists’ and ‘the empiricists’. This reflects not merely a growing dissatisfaction with these Kantian terms, but a heightened awareness that other historiographical perspectives can be just as useful, and in some cases, even more efficacious, for interpreting developments and trends in early modern thought.

My own research on the historiography of early modern philosophy in recent years has focused on developing the distinction between experimental and speculative philosophy as an alternative set of terms of reference for understanding early modern

philosophy. In my view, the experimental–speculative distinction is particularly illuminating for the interpretation of British philosophy, for it was in England that experimental philosophy first emerged as a distinctive methodology within natural philosophy, a methodology that was soon to extend into other branches of philosophy as well. Yet this is only one strand of revisionist historiography that the reader will find in this volume. Another recent revisionist trend in the historiography of early modern philosophy is found in Chapter 26 on toleration.

A third development in the study of early modern philosophy has been a reassessment of the philosophical canon. On the one hand, canonical works such as Locke's *Epistola de tolerantia* (1689) have been contextualized through the careful study of other contemporary writings on the same and cognate topics. This has had the effect, in some cases, of clarifying leading lines of interpretation of particular canonical works and deflating our assessment of the work's significance or impact. One important example is Francis Bacon's *Novum organum* (1620) which was the (p. 4) favourite entry point into Bacon's thought for many twentieth-century historians and philosophers of science. Recent developments in Bacon studies have revealed, however, that it can only be properly understood in the light of Bacon's natural historical works, such as the *Sylva Sylvarum*, which were far more popular and influential than the *Novum organum* in the seventeenth century (see Chapter 2).

The use of careful contextualization has not only impacted our understanding of canonical texts, but it has also enabled a clearer, and indeed a fairer, understanding of seventeenth-century Aristotelianism and of the ancient and continental influences on British philosophy of the period. Whether it be the persistence of the Aristotelian ontological categories and logic (Chapter 8, Chapter 10, Chapter 16), the influence of Epicurean atomism and hedonism (Chapter 9, Chapter 18), the influence of the new natural philosophical systems such as Cartesianism (Chapter 5), the impact of continental natural law theory (Chapter 20), or the influence of particular continental philosophers such as Jean Bodin (Chapter 25), British philosophy from the period can only be fully understood in so far as it is embedded in the wider intellectual culture of Western Europe and the renaissance of ancient learning.

On the other hand, the canonical works themselves have been subject to exacting scholarly scrutiny and their dates, processes, and rationale of composition are now far better understood. A case in point is Locke's *Two Treatises of Government* which, as a result of the pioneering work of Peter Laslett and the more recent researches of J.R. Milton and David Armitage, can now be more accurately related to political events that coincided with its composition, namely the Exclusion Crisis, plans for the Carolina colonies, and the Glorious Revolution of 1688 (see Chapter 23). Another example is Newton's *Principia*, a work of unparalleled importance in the history of science. Recent scholarship has shown that the philosophical import of this work can be far better understood in the light of a number of affiliated manuscript sources that were not available to Newton's contemporaries, such as the short work popularly known as '*De gravitatione*' (Chapter 4, Chapter 9).

A further consequence of the reassessment of the philosophical canon from the seventeenth century is the emergence and recognition of so-called 'non-canonical' philosophers who made interesting and even major contributions to the development of particular subjects. Of importance here are the writings of Kenelm Digby and Walter Charleton on the theory of matter and the passions (Chapter 9, Chapter 19), Robert Boyle on experiment, hypotheses, and theory (Chapter 3, Chapter 7), and even the writings of William Petty and John Graunt on statistical probability (Chapter 15). Furthermore, as the nature, breadth, and status of the canon have come under scrutiny, so too have the philosophical preoccupations of previous generations of historians of philosophy. This has resulted in the opening up of new domains and the consolidation of poorly understood fields such as the philosophy of the life sciences (Chapter 11) and the contributions of the very able (p. 5) women philosophers who were actively involved in British philosophy in the seventeenth century (Chapter 21).

For all that scholars might boast about the health of the discipline, there are still many who question the relevance of the study of great dead philosophers and their works. To be sure, most philosophers happily acknowledge the intrinsic interest and philosophical acumen of many of the central texts of British philosophy of the seventeenth century, but do they have anything to teach us today? This is not the place to engage in a full-scale justification of the study of early modern

philosophy, but I should like to conclude by pointing out that there are concrete lessons to be drawn from a number of the chapters in this volume: lessons both for contemporary philosophical debate and for a more accurate understanding of the role of philosophical arguments in the unfolding of historical events. A case in point is Shimokawa's chapter on 'The Origin and Development of Property' (Chapter 24) and its implications for our understanding of the original appropriation of the lands of Native Americans.

No *Handbook* can hope to provide absolutely comprehensive coverage of its field and there are some gaps and omissions in this volume. Some of these are owing to the pressures of deadlines, while others are owing to the need to keep the volume to a manageable size. Thus, there is no sustained discussion of what we would now call the philosophy of language and certain topics in the philosophy of religion receive only cursory treatment. Nevertheless, every effort has been made to ensure that there is a satisfactory balance of thematic continuity with overlap in content between chapters and it is hoped that together the twenty-six chapters that make up this volume provide a stimulating entrée into the main contours of and contributors to British philosophy in the seventeenth century.

Finally, there are a number of minor editorial comments that will help orient the reader. The first concerns dates. In seventeenth-century Europe two different calendrical systems were in use. Apart from Scotland, Britain followed the old Julian calendar which, at least in legal practice, retained 25 March as the beginning of the New Year and which was ten days behind the newer Gregorian calendar. All dates in this volume follow the Old Style Julian calendar, except that the New Year is dated from 1 January following common practice and the Gregorian calendar. Second, abbreviations have been used for frequently cited editions. In some cases, however, such as Hobbes' *Leviathan*, more than one edition of a work is cited across different chapters of the volume. Those editions of commonly cited works that are not in the list of abbreviations are cited by author and date. Furthermore, many early modern works are cited from modern editions and in these cases the date of original publication is provided in square brackets after the date of the modern edition. It remains to thank Sarah Hutton, Noel Malcolm, Peter Momtchiloff, Kiyoshi Shimokawa, and Alberto Vanzo for advice in the preparation of the volume and Nicholas Keene, who provided editorial assistance.

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## Becoming a Philosopher in Seventeenth-Century Britain

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The Oxford Handbook of British Philosophy in the Seventeenth Century

*Edited by Peter R. Anstey*

Print Publication Date: Jul 2013

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### Abstract and Keywords

This chapter, which examines what it meant to become a philosopher and work in the field of philosophy in Great Britain during the seventeenth century, analyzes the factors that influenced people to become philosophers and describes the circumstances in which they studied philosophy. It identifies a pattern by which the schools provided a preliminary framework for becoming a philosopher that later served as a creative foil for the pursuit of a philosophical career beyond the schools. The chapter also highlights the key developments during this period, which include the increasing prominence of (mono)theistic philosophical apologetics and the emergence of experimental natural philosophy.

Keywords: philosopher, philosophy, Great Britain, seventeenth century, schools, philosophical career, philosophical apologetics, natural philosophy

WHAT it meant to be a philosopher and to do philosophy in seventeenth-century Britain was, it almost goes without saying, distinct from that of other times and places. It is the purpose of this initial chapter to explore and chart this distinctive terrain (see also Feingold 1997b; Tuck 1998; Menn 1998; Rogers 2010). It will do so by endeavouring to identify some of the more important decisions that went into being, and especially becoming, a philosopher in this period. For what reasons did people decide to become philosophers? Under what circumstances did they pursue philosophy? And what were the different kinds of philosophy that they decided to pursue?<sup>1\*</sup>

## 1.1 Philosophy in the Schools

The separation of the sexes in early modern education meant that the path to becoming a philosopher for men was quite different to that of women in seventeenth-century Britain. Men who reached a certain level of education were required to be philosophers, (p. 10) or at least to do certain kinds of philosophy; for women a much more conscious decision, and a much less readily available course of education, was required. A male youth educated at a grammar school or tutored privately might be expected to study philosophical writings, particularly those of Roman antiquity, and particularly those of an ethical nature, as part of his early education in the Latin language. He might also expect to study some logic. But it was at university above all that young men became, and were required to become, philosophers. Both in the English and in the Scottish universities philosophy formed the central component of the arts course: the undergraduate curriculum that led, for those who took them, to the degrees of Bachelor and then of Master of Arts. This philosophy, moreover, further underpinned the theories and practices of the professional pursuits of medicine, law, and divinity, each of which in their different ways drew upon the procedures, principles, and presuppositions of the philosophical curriculum.

It therefore took no decision at all for an undergraduate at Aberdeen, say, or Cambridge, to become a philosopher: he was required to be one. A dutiful student, such as Simonds D'Ewes (1602–1650) at St John's College, Cambridge, under the tutorship of Richard Holdsworth, studied 'logic', 'ethics or moral philosophy', and 'Physics', or natural philosophy. He observed philosophy being done privately 'at problems, sophisms, declamations, and other scholastical exercises' in his college, and publicly at the Commencement Acts. In 1618 he replied to two 'philosophical acts', one public, one private; and in 1620 he was the opponent in the college chapel to his friend Jervas Nevill's position 'upon a philosophic question' (he does not say what) (D'Ewes 1845: I: 121, 138–9). D'Ewes left university without taking either a BA or MA degree, whereupon he turned his 'private studies' from the philosophical disciplines of 'physics, ethics, politics, oeconomics, and the like', towards the principal text in the Common Law, Littleton's *Tenures* (D'Ewes 1845: I: 145, 178); his later intellectual interests inclined him towards history and antiquities rather than towards philosophy (Cox Jensen 2009); and when he attended Cambridge Commencements in later life it was the theological rather than the philosophical questions that exercised him (D'Ewes 1845: II: 124). In all these respects D'Ewes was probably quite representative of his generation, and to an extent also of his century. All undergraduates would pass, perforce, through a philosophical phase; but it was rarer for them to decide to remain a philosopher longer than the period circumscribed by their undergraduate studies.

For this reason, students of philosophy were commonly explicitly described as youthful or 'junior'. Works of philosophy were not infrequently designated as being for, or addressed explicitly to, 'the youths' (*juventutes*) of a particular college or university (e.g. Flavell 1619; Burgersdijk 1637; Langbaine 1698). A contemporary work defines the age of the *juventus* as extending from between 25 to 35 or even 40 years of age (Stier 1647: 51), but we may take it that in the universities it began rather earlier than that. A related way of conceiving of this age of education was as a period of 'juniority'. Anthony Wood reported that the logical *Tractatus de (p. 11) demonstratione* (*Treatise on demonstration*, 1619) by John Flavell (1596?–1617) 'hath been taken into the hands of all juniors' (Wood 1813–20: II: 207). Indeed, not only was Flavell's treatise read by juniors, it had been written by one: Flavell was not yet twenty when he gave the dictations from which his editor Alexander Huish reconstructed the posthumous volume (Flavell 1619: sig. ¶3<sup>r</sup>, trans. Binns 1977: 9–10). Inevitably, therefore, the study of philosophy was regarded, to some extent, in this 'junior' light.

The youthful status of philosophy also brought with it a whole set of assumptions about the proper attitude to philosophical authority. Aristotle was held to have furnished the principle that 'Beginners must beleeve' (*oportet discentem credere*) (Rainolds 1638: 40; cf. Aristotle, *De sophisticis elenchis*, 1.2), or as Alexander Ross put it, 'He that learns ... must believe his Masters positions' (Cambridge University Library, MS Dd. 12. 30: fol. 163<sup>r</sup>). The persona of the philosophical pupil was therefore submissive, deferential, and necessarily credulous. For these reasons, although it continued to be defended (Reynolds 1640: 491–2), this maxim was also regarded by a number of authors from Francis Bacon onwards as presenting a real hindrance to philosophical advancement: men in the universities, he wrote in the early piece 'Of Tribute' (c. 1592), 'learn nothing there but to believe' (Bacon 1996: 36), and in the *Advancement of Learning* (1605) he went on to oppose to it the maxim that '*Oportet edoctum iudicare*: for Disciples doe owe vnto Maisters onely a temporarie beleeffe, and a suspension of their owne iudgement, till they be fully instructed, and not an absolute resignation, or perpetuall captiuitie' (OFB 4: 28). It was in these terms that the question of what 'juniors' were to be taught became a battleground from the 1640s onwards (Webster 2002). In 1649 John Hall spoke in his exhortation to Parliament to reform the universities of 'old experiments & traditions which gull so many *junior* beliefs' (Hall 1649: 27), while in the rather different circumstances of the early Restoration Joseph Glanvill found himself involved in some fairly contorted arguments over the proper 'use of *Aristotle* in the *Universities* among the *Junior Students*' (Glanvill 1665: 78).

One particular class of student, however, retained its philosophical interests beyond this period of juniority. These were those Masters of Arts who remained in the universities after having taken their undergraduate degrees, in order to study for their professional qualifications. These teaching MAs—the more professionalized descendents of the Regent Masters who played such an important role teaching in medieval universities—also have an important role to play in seventeenth-century British philosophy, for they produced much of it, both published and unpublished. It was these MAs in their twenties who provided the template for the 'stripling yongster' castigated by John Hall, who 'mounts up into the chaire twice or thrice a yeare, to mutter over some few stolne impertinencies' (Hall 1649: 27–8). They acted as tutors to their undergraduate charges; 'read'



philosophical authors with the students—like the ‘beardless’ (*imberbus*) praelector who read logic with Thomas Hobbes (1679: 2) at Magdalen Hall in the first decade of (p. 12) the seventeenth century; and filled college and university lectureships in philosophical subjects. In the process they generated a large body of pedagogic philosophical materials of their own in manuscript and, sometimes, in print.

It is likely that these lectureships in philosophical subjects would play a more important role in our understanding of the field if they were more systematically studied (but see Frank 1973). At the beginning of the seventeenth century neither of the two English universities had chairs in the standard philosophical disciplines of natural philosophy, moral philosophy, or metaphysics, and certainly not in the lowly but foundational discipline of logic (Fletcher 1986: 185–8). Colleges, however, did provide for individual lectureships in philosophical subjects, and in the course of the seventeenth century several new ones were founded in the universities themselves as well. These foundations relied above all on private donation, even if the estates both of Francis Bacon, Viscount St Alban (d. 1626) and of Sir Edwin Sandys (d. 1629) were insufficient to support their planned endowments of lectureships in both universities in natural philosophy (Spedding 1861–1874: VII: 544, 547) and metaphysics (Rabb 1998: 390), respectively. At Oxford Sir William Sedleigh endowed a lectureship in natural philosophy by his will of 1618—this tended to be held by physicians, such as Edward Lapworth (1574–1636) and Thomas Willis (1621–1675); while Thomas White founded a lecture in moral philosophy in 1621 during his lifetime. Sir Henry Savile’s chairs in Geometry and Astronomy supported the natural philosophy of John Wallis (1617–1703) and Seth Ward (1617–1689) before the latter, at least, preferred to take up a bishopric in the Restored Church of England. In Cambridge, Henry Lucas founded by his will (1663) the chair in mathematics that bears his name and which supported the work, both in mathematics and in natural philosophy of, successively, Isaac Barrow (1630–1677), Isaac Newton (1642–1727), and William Whiston (1667–1752). Nonetheless, the most prestigious (and remunerative) chairs remained those in the biblical languages and in theology. Ralph Cudworth, DD (1617–1688) wrote one of the most ambitious and influential works of seventeenth-century English philosophy, the *True Intellectual System of the Universe* (1678), during his tenure of the Regius chair of Hebrew and the mastership of Christ’s College. A notorious Cambridge figure of a later generation, Richard Bentley (1662–1742), now principally remembered as an editor of Latin and Greek poetry, turned Newtonian natural philosophy to the service of Christian apologetic as the first Boyle Lecturer in 1692 (Bentley 1693; Dahm 1970), and it was to the Regius Professorship of Divinity that he contrived to elect himself in 1717. In seventeenth-century England there was thus very little opportunity for someone inclined towards philosophy to spend a lifetime in a chair in the subject, as Jacopo Zabarella (1533–1589) or Fortunio Liceti (1577–1657) had done at the University of Padua, in the very different circumstances of Renaissance Italy, so much more willing as it was to separate philosophy and religion.

It was therefore probably during the temporary tenure of a lectureship that a good deal of seventeenth-century British philosophy was written, or at least (p. 13) conceived. Barten Holyday (1593–1661) specifically tells us that it was the circumstance of his having been the Praelector first in rhetoric, then in philosophy, at Christ Church—which he was between 1617 and 1621 (Burns 2004)—that gave rise to his *Philosophiae politico-barbarae specimen (A Model of Civilo-Barbarous Philosophy*, 1633: sig. A2<sup>r</sup>), a pair of witty and elegant treatises on the soul and on its intellectual habits. Rather more earnest, but no less the outcome of a relatively young Master of Arts taking his lectureship seriously, were the *Exercitationes aliquot metaphysicae (Several Metaphysical Exercises)* that Thomas Barlow (1608–1691) published as an appendix to his 1637 Oxford edition of the Giessen philosopher Christoph Scheibler’s larger *Metaphysica*: Barlow had been appointed to the university readership in metaphysics two years earlier, in 1635 (Spurr 2004). One of Holyday’s successors as Praelector in rhetoric at Christ Church was the young John Locke (1632–1704), who held the office in 1663. But it was as the incumbent of a different lectureship, the Censorship in Moral Philosophy, that Locke a year later wrote eight Latin theses on the law of nature, together with a jocular *envoi* to his office, which offer some of the earliest evidence for his philosophical formation and development (Locke 1954 and 1990). In each case these philosophical works arose directly from the impermanent institutional role occupied by their relatively young authors. In the case of Locke many of the questions—though not always the answers—of the book he referred to in the philosophical terminology of the schools as his ‘*de intellectu*’ are those of the logic, natural philosophy, and metaphysics of the arts course (Ashworth 1981; Serjeantson 2008). Nonetheless, with the important exception of Locke, the decision of these Masters of Arts to pursue philosophy was

as a staging post in a career that did not have philosophy as its ultimate goal.

A significant example of someone who decided to pursue philosophy in this capacity is offered by the figure of Robert Sanderson (1587–1663). Sanderson matriculated from Lincoln College, Oxford, in July 1603, possibly some time after his arrival there, for he graduated BA in only January 1605. He proceeded MA in good order, in October 1607; and he thereafter stayed at Lincoln, which had elected him to a fellowship in 1606, until 1619. Nonetheless, after his canter through the arts course it was only in 1617, after ten years of postgraduate study, that Sanderson obtained the degree of Bachelor of Divinity (BD), whereupon he took up his first living (McGee 2004). It was during his ten years of postgraduate study that Sanderson produced his philosophy, our evidence for which is the publication of two books arising from his teaching. In 1615 there appeared his *Artis logicae compendium* (*Abridgement of the Art of Logic*) (Ashworth 1985). Posthumously, its companion volume, *Physicae scientiae compendium* (*Abridgement of Natural Knowledge*, 1671), also emerged, ‘intended to have been published many years previously and now first printed from an authentic manuscript’ (*ante multos annos lucis usurae destinatum nunc vero ex authentico manuscripto primo impressum*) (p. 14) (Sanderson 1671: t-p). It too certainly dates from the period of Sanderson’s career that he spent as a BD student, teaching juniors the philosophy of the arts course.

Sanderson was therefore both a typical and, through the repeated republication of his books, also a prominent representative of a certain kind of university philosophy. This philosophy was ‘scholastic’, not in the sense that this word is sometimes loosely used in reference to early modern philosophy that happens to be written in Latin but in the strict sense in which Simonds D’Ewes used it, and in which it will be used here: as the kind of philosophy that was pursued in the ‘schools’, and specifically in the physical location of the schools of logic, rhetoric, moral and natural philosophy at which lectures were delivered and public disputations in philosophy took place. A geography of these schools is evident to this day in the quadrangle in front of the Bodleian Library, where the headings over the doorways still record the locations of the former ‘schools’, including the *schola naturalis philosophiae* and the *schola moralis philosophiae*.

Sanderson’s work as a philosopher and as a teacher of philosophy therefore took place as a way station on his journey to higher goals: a qualification in divinity, a living (or more than one), and ultimately the bishopric of Lincoln. This is not to suggest that his philosophy was produced for merely careerist purposes; plenty of other MAs on their way to a good living did not publish the fruits of their teaching. Nor is it to suggest that Sanderson lost his intellectual interests: on the contrary, by the time of his death in 1663 his publications in moral theology had led to his becoming regarded as the foremost English casuist of his age (Kelly 1967). But it goes some way towards indicating two fundamentally important features of British philosophy in the seventeenth century: firstly, the relatively lowly status accorded to it by comparison with other forms of intellectual endeavour; secondly, its professional situation as a way station on a journey towards the professions and especially divinity. The almost total lack of interest in Sanderson’s philosophical career in modern scholarship on him is an indication of the subordination of the temporary occupation of the philosopher to the permanent profession of divine. There was no life-long profession of philosophy in early modern Britain: no institutional structures, whether in the universities or elsewhere, to encourage its pursuit into middle age.

Both as a cause and an effect of these institutional arrangements, then, the majority of English intellectuals with professional ambitions turned from the pursuit of philosophy to the ‘superior’ faculty of divinity. It was the Church that provided the best, and in many cases, the only opportunities for social and financial advancement. One or two of the scholars who lectured in logic and philosophy as young college fellows in the course of their studies for the BD might hope one day to succeed to a Professorship of Divinity, as Thomas Barlow (1608/9–1691) did, and as the metaphysician Thomas Jackson (1578–1640) hoped to (Hegarty 2004). Beyond these chairs there might lie, as there did for Barlow, an episcopal see, sometimes even a rich one. Richard Crakanthorpe (1568–1624), who published a (p. 15) handbook of metaphysics (1619) and a sophisticated treatise of logic (1622), was said by King James VI and I to have died for want of a bishopric, not a chair of philosophy (Cambers 2004). And as Nathaniel Carpenter (1589–1628), author of the widely read *Philosophia libera* (1621–1622), died he repented ‘that “he had formerly so much courted the maid instead of the mistress,” meaning that he had spent his chief time in philosophy and mathematics, and had neglected divinity’ (Wood 1813–1820: II: 422). However far one credits this

relatively conventional disavowal of humane learning in the face of death and judgement, it is further indication of the subordination of philosophy to divinity in the priorities of the period.

These priorities also operated, in a rather different way, in Scotland. The accession of James VI of Scotland to the English crown in 1603 means that in the seventeenth century we can, if we wish to, speak properly for the first time of ‘British’ philosophy. We should not imagine, however, that philosophy necessarily stood for the same thing or served the same purposes in England as it did in Scotland. In some ways philosophy had more autonomy in Scotland than it did in England in the seventeenth century. Partly owing to long-standing trading and emigrant connections, the Scottish universities were somewhat more open than the English ones to influence from the German-speaking lands, particularly the Baltic states, where the independent study of philosophy flourished more than it did in England (Hotson 2007). The intellectually eclectic figure (Maclean 2001: 336) of Duncan Liddel (1561–1613), a graduate in philosophy of the University of Rostock, and a benefactor of the newly-founded Marischal College in Aberdeen, is a case in point (Platts 2004), as too is Liddel’s student Patrick Dun (Vance 2004). It is also probably true to say that no English philosopher would, or could, have written the oration with the winning title of *Philosophia illachrymans* (*Weeping Philosophy*) that the royalist David Leech delivered at King’s College in Aberdeen on 26 July 1637. Subtitled ‘the lament of philosophy, and of Scottish philosophers’, and consisting of a defence of the place of philosophy among the other disciplines and in the commonwealth as a whole, its auditory consisted of candidates for the degree of Master of Arts who had passed through the philosophy course with honours and been rigorously examined upon it (Leech 1637). Yet philosophy had less cause to complain in Aberdeen, where Leech was a Professor in the subject, and where his students’ theses were regularly printed (e.g. Ray 1643, Meldrum 1659), than it did in England, where the positions that sustained it tended to be not chairs but mere lectureships, and where broadsides of satirical Act verses, not scholarly disquisitions, were the most common record of its teaching (Hall 2009).

Scottish philosophers, too, were ahead of English ones in picking up on the Protestant philosophical endeavours of the so-called ‘second reformation’ to reconcile philosophy and theology. This programme also became an important goal in (p. 16) certain quarters in England in the 1630s, and as a consequence Scottish philosophy became more important to England than English philosophy was to Scotland. Evidence for the significance of this programme in Oxford stems from the evident attraction there of a work by a Scottish philosopher, Robert Baron (c. 1596–1639), who before he took his DD degree in 1627 taught as Professor of Philosophy at St Salvator’s College at St Andrews. Baron, who later emerged as a convinced royalist, defended the status of philosophy as the handmaid of divinity (Baron 1621: sig. ¶2<sup>r</sup>): his *Philosophia theologia ancillans* (*Philosophy the Handmaid of Divinity*), which first appeared at St Andrews in 1621, was reprinted in Oxford in 1641 and again in 1658; while his similarly inclined treatise of metaphysics was published posthumously in Cambridge as late as 1685. More generally, it is also possible that the Scottish example lies behind the efforts that were briefly made to print quadragesimal theses at Oxford in the aftermath of the civil wars (e.g. Potter 1651; Feingold 1997b: 379; Worden 1997). Scottish (and Scots-Irish) philosophy also proved attractive to English non-conformists in the later seventeenth century: an important figure here was Thomas Gowan (1631–1683), who after taking his MA at Edinburgh made a living teaching philosophy in Ulster, where by 1675 he had ‘an official monopoly’; Gowan’s logic manual entitled *Ars sciendi* (*The Art of Knowing*), which is notable for providing the first treatment of ‘hermeneutics’, explicitly so-called, in Britain (Gowan 1681: 321–44) was also used in English dissenting academies—and at Harvard College (Stewart 2004). Other Scottish philosophers, such as the Aberdonian George Dalgarno (c. 1616–1687), found England, initially at least, a congenial place to pursue his studies in universal language (Dalgarno 2001); and another Scots scholar and philosopher, Alexander Ross (1591–1654), pursued an extensive authorial career in England, issuing critiques of such singular and dangerous philosophers as Francis Bacon, Kenelm Digby, John Wilkins, William Harvey, and Sir Thomas Browne, as well of course as Thomas Hobbes (Johns 1997; Allan 2007).

The general lack of sustained institutional support for philosophy in the English and, to a lesser extent, the Scottish universities, combined with the *Drang nach Theologie* inherent in these academic cultures, had several consequences. Firstly, a good deal of philosophy was written by relatively young men who then moved on to other concerns. Secondly, many of the most ambitious and penetrating works of philosophy were produced by authors whose vocation for their subject was enabled by leisure and supported by means derived from other sources. The relatively low status of philosophical

education in the schools, too, perhaps contributed to the vehemence of the criticism directed against it by those authors, such as Joseph Glanvill, who were concerned to emancipate and elevate its status—even when, as in the case of Glanvill, many of the ideas he proposes are ones to which he was first exposed at university.

This notwithstanding, both within and without the schools the principle of philosophical freedom (*libertas philosophandi*) was widely acknowledged as a (p. 17) virtue in seventeenth-century England (Webster 2002: 177; Feingold 1997b: 387). Admittedly the idea was sometimes appealed to at moments of tension, such as when it became a point of conflict between Seth Ward (1654: 59) and Thomas Hobbes (1656: 61) in their debate over the universities in the mid-1650s. But it was also possible to endorse the principle within the ambit of the schools (Feingold 1998): Nathaniel Carpenter did so in his *Philosophia libera* (1622). The theses that graduating Bachelors were required to defend were limited in that the position to be taken (whether affirmative or negative) was predetermined; but within that constraint juniors were allowed and indeed expected to be original. In his petition for the reformation of the statutes of the University of Oxford Thomas Gilson begged that not Aristotle or Plato, but right reason might be the supreme authority in the exercises of the University, ‘so that Free Philosophy and ingenuous youth might better flourish and grow’ (*magis vigeat floreatque Libera Philosophia et ingenua Juventus*) (Webster 2002: 523). In dedicating an edition of Johann Stier’s philosophical *Praecepta* to the precocious John Hall, his printer Roger Daniel asserted that the young ‘should first have sipped watered wine from the peripatetic ladle’ (*villum prius pitisset e simpulo Peripatetico*) before proceeding to the ‘sumptuous banquets of free philosophy’ (*ad opiparas dapes liberae philosophiae*) (Stier 1647: sig. A2<sup>r</sup>). When Edmund Dickinson published his (if it is his) *Delphi Phoenicizantes* at Oxford in 1655 (Toomer 1996: 67; Stroumsa 2010: 53) his publisher found himself with a largely empty final gathering, and so in order to make up the space Dickinson furnished a ‘little speech on behalf of philosophical freedom’ (*Oratiuncula pro philosophia liberanda*) which he had delivered two years earlier at Merton College. In it, Dickinson criticized any dependence of philosophy upon a single authority, and argued that the arts are not like mushrooms, which spring up overnight, but rather that they develop through labour and by daily growth (Dickinson 1655: sig. P1<sup>r</sup>). In subscribing the *imprimatur* of *Philosophia naturalis reformata* (*Natural Philosophy Restored*, 1641) by the Dutch scholars Gerard and Arnold Boate, the clerical delegate of its dedicatee Archbishop Ussher praised it for being ‘written with a truly philosophical liberty’ (*liberate vere philosophica conscriptum*) (Boate and Boate 1641: sig. A4<sup>v</sup>). (It should be noted, however, that being printed in Dublin, where Arnold was then living, this book cannot be said to constitute ‘British’ philosophy.) For Gideon Harvey, writing in his *Archelogia philosophica nova* (1663), the phrases *libere philosophandum* and *non est jurandum in verba Magistri* (the latter of which had just become the motto of the new Royal Society) had already become ‘trite Sayings’ (Harvey 1663: 9). In this respect, as in others, there was less of a divorce between the philosophy practised within the schools and that pursued outwith them than is sometimes presumed.

## (p. 18) 1.2 Philosophy beyond the University

The philosophers of the schools did not always abandon their philosophy once they had left their portals. On the contrary: at least in the earlier part of the seventeenth century, a prominent pattern emerges of divines who retained their philosophical interests sufficiently to produce works of natural philosophy in particular when (on their own accounts) they owed a duty to a higher calling (Feingold 2002). Robert Payne offers a notable instance of this phenomenon (Feingold 1985). Such scholars had encountered philosophy in their juniority, but kept it up into their maturity: it was an aspect for them of the intellectual culture of ‘general learning’ (Feingold 1997a: 219–21; Serjeantson 1999), in which philosophy—especially natural philosophy—joined forces with history and philology in the service of establishing ‘the truth of christianity upon a rationall account’ (Casaubon 1999: 93).

An important instance of a divine who maintained and elaborated his philosophical interests beyond his ordination is offered by Edward Reynolds (1599–1676), whose *A Treatise of the Passions and Faculties of the Soul of Man* (1640) was one of the most ambitious, and frequently reprinted, works of philosophy published in English in the middle years of the century. Reynolds had taken up his first living in 1622 before he even took his MA degree, from Merton College, Oxford, in 1624, and



he went on to become a prominent figure among the godly in his adopted county of Northamptonshire, and (notably, for this moderate presbyterian) Bishop of Norwich in the Restoration (Atherton 2009). Reynolds' puritan convictions did not prevent him from publishing his philosophical *Treatise*, with a dedication to Charles I's niece Elisabeth of Bohemia (herself later the correspondent of René Descartes). They did, however, cause him to begin it with an elaborate preface asserting the necessity of humane learning for divinity, and cautioning that he did not 'admire Philosophy, to the prejudice of Evangelicall knowledge' (Reynolds 1640: sig. a2<sup>v</sup>; also Reynolds 1658). Reynolds' decision to appear before the public as a philosopher, therefore, was more than intellectual: it was vocational and professional as well.

Physicians were members of another profession who also sometimes continued their philosophical investigations beyond the schools. As might be expected, their studies almost always centred upon the philosophical discipline that was intimately bound up with medicine: natural philosophy; for where the work of the natural philosopher ended, that of the physician began (*ubi desinit philosophus, ibi incipit medicus*) (Maclean 2001: 80–2). Robert Fludd (1574–1637) elaborated his philosophy of the micro- and macrocosm in the course of his work as a physician in London, and through it obtained a pan-European fame, or at least notoriety (Fludd 1617–1719; Maclean 2008). The figure of William Harvey (1578–1657), by contrast, offers an instance of a much more loyally Aristotelian physician (Schmitt 1984) whose discoveries in natural philosophy (French 1994) were, as his friend Thomas Hobbes (1655: sig. A2<sup>v</sup>) admiringly observed, 'received in all the Universities (p. 19) in the world' in his own lifetime (Aubrey 1992: 131). The same cannot be said of the *Archeologia philosophica nova, or New Principles of Philosophy* (1663) by William's much less celebrated namesake Gideon Harvey (1636/7–1702), also a physician; his elaborate still-born quarto is nonetheless interesting as an indication of the penetration of Jesuit philosophical pedagogy into England, and the English language, in the middle years of the seventeenth century. Two further physicians also obtained high contemporary reputations, one of which has proved more lasting than the other, for their work in natural philosophy that arose directly from their medical studies. Francis Glisson, the Regius Professor of Physic at Cambridge but also a practising physician in London, eventually published his philosophical *Tractatus de natura substantiae energetica, seu de vita naturae* (*On the Nature of Energetic Substance, or on the Life of Nature*, 1672; also Glisson 1996). This moment of marriage between anatomy, metaphysics, and natural philosophy was not one that survived the dogmatically anti-metaphysical impact of the new 'experimental natural philosophy', and its reviewer in the *Philosophical Transactions* (1672: VII: 5077) noted with circumspection the potential objection that 'general notions are too soon brought upon the Stage'. The same charge was not levelled at Thomas Willis, Sedleian Professor of Natural Philosophy at Oxford but again also a professional physician, for his highly regarded publications on the anatomy of the brain (*Cerebri Anatome*, 1664) and on the nature of animal soul (*De anima brutorum*, 1672). Both Glisson and Willis were founder members of the Royal Society, a body with a strong proportion of medical men among its early membership (Hunter 2006), and the most visible institutional home for experimental philosophy after its inauguration in 1660.

The last of the three professions for which the philosophy of the arts course formed a foundation was the law (O'Day 2000: 129–30). In their common law jurisdiction English lawyers did not on the whole explicitly develop the elaborate philosophical justifications for their work that the *ius commune* encouraged on the continent of Europe (Kelley 1976, 1988; Maclean 1992). And compared with physicians and divines, seventeenth-century lawyers—that *profession*, which usually takes up mens whole time' (Sprat 1667: 36)—were probably least inclined to pursue philosophy as well as lucre. Nonetheless, even the 'common law mind' can now be seen to have had strong neo-Aristotelian philosophical presuppositions (Tubbs 2000: 173–8), and this is particularly evident in the application of the philosophical discipline of logic, whether Ramist or otherwise, to the methodical study of the law (Fulbeck 1600; Doddridge 1631). Certain lawyers, as well, turned their minds to philosophical investigations of a wide variety. The most celebrated legal philosopher, then and now, was Francis Bacon (1561–1626), whose ambitions centred on his Great Instauration of natural philosophy (OFB 11–13). Despite William Harvey's derisive remark that Bacon 'writes Philosophy like a Lord Chancellor' (Aubrey 1992: 130), Bacon was not entirely singular in being a lawyer with highly-developed interests in natural philosophy. Sir Matthew Hale (1609–1676) was similarly interested (Cromartie 1995: 195–233); but Hale also wrote an ambitious treatise on (p. 20) human nature, *The Primitive Origination of Mankind* (1677), in which he returned to the philosophical principles of his arts course education to produce a posthumously-published contribution to the well-populated field of Restoration philosophical apologetic. Much

more original is the *De iure naturali et gentium, juxta disciplinam Ebraeorum* (*On the Law of Nature and Nations According to the Teaching of the Hebrews*, 1640) by the polymathic lawyer John Selden (1584–1654). The philosophical ambitions of Selden's book are inseparable, as is so often the case in seventeenth-century philosophy, from its historical scholarship: alongside invoking philosophical concepts such as the 'agent intellect' (*intellectus agens*) to explain human knowledge of the obligations imposed by natural law, Selden sought to reconstruct the revelation of such laws to the Jews from biblical and other Hebrew sources (Tuck 1979; Sommerville 1984; Toomer 2009: 2: 490–562). And Selden, too, knew his natural philosophy (Feingold 1991).

By no means all seventeenth-century British philosophers, however, had to resort to the pursuit of a profession. Aristotle's observation in his *Metaphysics* that leisure was the mother of philosophy was turned into one of the many dry jokes against religion and the schools that intersperse part IV of Thomas Hobbes' *Leviathan* (Hobbes 1651: 368; Serjeantson 2006). But this was a period in which philosophy was not infrequently the pursuit of members of a class that defined itself by its possession of leisure, and its lack of dependence upon any master: the gentry and nobility. Thomas Sprat in his *History* of the early Royal Society insisted that the great majority of its members were '*Gentlemen*, free, and unconfin'd' (Sprat 1667: 67), and modern studies of the social origins of the members of the early Society largely bear out his claim (Hunter 1985). The consequences of these social origins for the nature and content of seventeenth-century philosophy (including natural philosophy) have long interested scholars (Thomas 1965) and continue to be debated (Shapin 1994 has provoked numerous responses).

Some of these extra-scholastic philosophers were representatives of gentry families who beguiled their leisure with the knowledge of human and divine things rather than 'Hawking and Hunting' (Locke, *Essay*: 6). These families might be ancient Catholic ones, like the one Sir Kenelm Digby (1603–1665) arose from (Foster 1988; Henry 2010) or marginal ones whose sons could not quite hope to live off their inheritance, such as was the case with John Locke. Other philosophers possessed titles of nobility, often of relatively recent creation. Robert Greville, second baron Brooke (1607–1643), who subsequently became a Parliamentary commander, wrote and published a book of pansophic metaphysics, *Of Truth* (1640). Edward, third earl Conway (c. 1623–1683), was described by Henry More (1659: sig. A4<sup>r</sup>) as having 'skill in Philosophy & a real sense of Piety'—although it was not he but his wife, Lady Anne Conway, who was the author of the treatise 'On the most ancient and modern principles of philosophy' that was published in Amsterdam in a volume of *Opuscula philosophica* (1690), but which is still sometimes mistakenly ascribed to him (e.g. by Kelsey 2008; compare Hutton (p. 21) 2004: 1–2, 225–8). The moral philosophy of 'politeness' articulated by Anthony Ashley Cooper, third earl of Shaftesbury (1671–1713), was a consciously gentlemanly one (Klein 1994: 41). The author commonly referred to in modern editions of her philosophical writings as Margaret Cavendish (2001) was identified in one of her own lavishly produced books as 'the thrice noble, illustrious, and excellent Princesse, the Duchess of Newcastle' (Cavendish 1666). The Honourable Robert Boyle (1627–1691) similarly introduced himself as such on the title pages of those of his books he did not publish anonymously (e.g. Boyle 1660, 1661), and his readers and correspondents were never unaware of his situation as the youngest son of the extremely wealthy Earl of Cork.

Other philosophers obtained titles of honour through government service, and pursued philosophy alongside their professional commitments. This category includes the Lord Chancellor Francis Bacon (1561–1625), who was knighted in 1604, created Baron Verulam in 1618, and Viscount St Alban in 1621. It also includes the friend of Bacon's last years, Edward Herbert, author of the *De veritate* (1624), who was awarded the baronies of Castle Island in Ireland in 1624 and Cherbury, in the Marches, in 1629, in recognition of his ambassadorial services to the Stuart crown. Positions in government, not necessarily sinecures, also provided a destination for philosophers in their prime: after finding fame with the publication of their philosophical masterpieces both John Locke and Isaac Newton gained employment from the post-Revolutionary regime, on the Board of Trade and in the Mint respectively.

No less important than the role the gentry and aristocracy played as philosophers themselves was their role as patrons of philosophers and mathematicians (the two categories often overlapped). Sir Cheney Culpeper (1601–1663) supported several philosophers associated with the circle around Samuel Hartlib (Greengrass et al. 1994). Sir Charles Cavendish

(1595?–1654) was the patron of Robert Payne, Walter Warner, and the correspondent of Thomas Hobbes and John Pell (Malcolm and Stedall 2005). As this suggests, some of the most significant philosophers of the seventeenth century wrote as clients of noble or wealthy patrons (Tuck 1998). The most notable instance of this, perhaps, is Thomas Hobbes (1588–1679) who was for almost his entire adult life a retainer—in various capacities centring around the role of tutor—of the Cavendish family (earls of Devonshire and of Newcastle). It would be quite misleading to regard Hobbes as anyone’s hired pen; nonetheless, several of his writings owe their being to his professional circumstances: in particular (if it was indeed Hobbes who wrote them) some of the essays that appeared over the name of his charge William Cavendish (Hobbes 1996), and also his early work of royalist political philosophy, *The Elements of Law*, written in 1640 at the behest of the earl of Newcastle and circulated in manuscript among his patron’s peers.

John Locke, who continued as a Student (i.e. a fellow) of Christ Church, Oxford, until his expulsion in 1684 (Milton 2009), nonetheless found in the patronage of (p. 22) Anthony Ashley Cooper, first earl of Shaftesbury, a range of opportunities to exercise and develop his talents in medicine and politics; this work also afforded him the opportunity to pursue political philosophy in the form of the *Two Treatises of Government* (c. 1683; published 1689), with their Shaftesburian goals, and also the investigations into the foundations of morality and revealed religion, and logic and metaphysics, that ultimately resulted in his *Essay concerning Human Understanding* (begun 1670/71 and published in late 1689).

So far all the philosophers we have considered were born in Britain, even if—like Herbert, Digby, Hobbes, and Locke, not to mention William Ames or Thomas White—they wrote some or all of their philosophical works abroad, in France or the Low Countries. But Britain, and especially England, provided a refuge, either temporary or permanent, for a good number of philosophers from other European countries. Sometimes, too, it even provided them with an opportunity to publish their writings. Several works by the Bohemian intellectual reformer Jan Amos Comenius (Jan Amos Komenský; 1592–1670) were published in London before he himself arrived to spend eight months in England in 1641 to promote his project of *pansophia*: a ‘more ample way of handling things, than can be used either in Philosophie, or Divinity severall by themselves’ (Comenius 1642: 77; translating Comenius 1639: 251). Comenius’ host in England was himself an immigrant: the intelligencer Samuel Hartlib (c. 1600–1662), who served as the nexus of a wide correspondence network in the middle years of the century (Greengrass 2002) and whose *Ephemerides* offer an unparalleled insight into the impact of philosophical publications from the 1630s to the 1650s upon an intelligent and curious reader (*Hartlib Papers* 2002). It was Hartlib, too, who first welcomed Comenius’ client Georg Ritschel (1616–1683), another Bohemian, to England in 1645 (Young 1926; Howell 1968), where he published his Comenian *Contemplationes metaphysicae* (1648), which remained of interest to the circle of universal language theorists around John Aubrey in the later 1670s (Lewis 2007: 209–12). In the Restoration Henry Oldenburg (c. 1619–1677), another continental European émigré, took up Hartlib’s role as an intelligencer at the heart of a European philosophical correspondence. Oldenburg, patronized by Robert Boyle, served as Secretary of the new Royal Society, keeping the books, maintaining its correspondence with foreign philosophers, and noticing new books in the Society’s journal, the *Philosophical Transactions* (1665–1678, 1683–), which Oldenburg edited until his death. Oldenburg’s extensive correspondence, with Spinoza among many others, records his intense engagement with the new experimental philosophy (Oldenburg 1965–1986); he has also recently been identified as the author of the manuscript of an unfinished English translation of Malebranche’s *De la Recherche de la vérité* (Malcolm 2005: 6 n. 22). The principal promoter of Cartesian philosophy in England, after Henry More’s turn away from him (Gabbey 1982), was also an émigré: Antoine le Grand, OFM (1627/8–1699), whose *Institutio philosophiae secundum principia Renati Descartes* (1672) was translated into English with numerous (p. 23) symbolic plates as *An Entire Body of Philosophy, According to the Principles of the Famous Renate des Cartes* (1694). Le Grand’s books were intended in their original Latin ‘for the use of academic youth’ (*in usum juventutis academicae*)—an audience not restricted to the two English universities, for the Franciscan Le Grand taught philosophy to sons of the Roman Catholic gentry, who were excluded from them by religious test. But the lavish English edition of his philosophy—undertaken speculatively, and in Le Grand’s view unsatisfactorily (Acworth 2004), by the stationer Richard Blome—suggests that there existed an audience for his ideas that was unconcerned by his Catholicism and which reached some distance beyond scholastic youths. As such, these two volumes are suggestive both of the distinction between school philosophy and that pursued outside the schools, and also of the fluidity of that distinction in seventeenth-century



British culture.

## 1.3 The Parts of Philosophy

The pattern we have identified so far is one in which the schools provided a preliminary framework for becoming a philosopher, but which then served as a creative foil for the pursuit of a philosophical career beyond the schools. This pattern can also be found when we turn to the question of the different forms philosophy took in seventeenth-century Britain. Indeed, this question of how to divide up, and ideally also how organize, the discipline of philosophy (*partitio philosophiae*) was one that preoccupied many different British philosophers. Those who wrote from within the framework of the schools were perhaps principally motivated by the pedagogic consequences of such partitions—such as the non-conformist exile William Ames, professor of theology at the University of Franeker in northern Friesland, in his *Technometria* (1633 [1979]; see also e.g. Chasteignier de la Rocheposay 1617; Sanderson 1615: 101–9). For others, identifying the different divisions of philosophy, and their relations, formed either a ‘*Preparatiue*’ (Bacon 1629: 86; see also Bacon 1623; Hobbes 1651: 40) or a conclusion (Locke, *Essay* iv. xxi) to their grand designs of philosophical reformation.

One foundational and prominent discipline nonetheless possessed a somewhat ambiguous status in relation to philosophy: logic. Logic was a subject to which numerous seventeenth-century British philosophers contributed, and with which all were intimately familiar (Feingold 1997a: 276–306)—a familiarity that is not always sufficiently reflected in modern historiography of the field. But as the common locution ‘logic and philosophy’—a constant motif, for instance, in Anthony Wood’s accounts of his subjects’ educations (Wood 1813–20)—suggests, logic was not necessarily regarded as a philosophical discipline per se. Nonetheless, (p. 24) both within and beyond the schools logic was almost universally regarded as providing a necessary foundation for philosophical investigation (e.g. Hall 1655: 217–39). For logic was the ‘instrumental’ discipline *par excellence*, a status recognized in the Renaissance coinage of the term *organon* (‘instrument’) specifically to describe Aristotle’s logical writings. It was, as John Prideaux instructed, ‘necessary to the learning and teaching of other sciences’ (*An logica artificialis sit necessaria ad caeteras scientias discendas & docendas? A[ffirmatur]*) (Prideaux [n. d.]: 5). It is true that a number of authors offered critiques of logic that were well-known in seventeenth-century Britain (by e.g. Webster 1654: 34–37); Francis Bacon in the *Novum organum* (*New Instrument*, 1620), Pierre Gassendi in his *Exercitationes paradoxicae adversus Aristoteleos* (*Paradoxical Exercises Against the Aristotelians*, 1624; and especially the second book, first published only in 1658), and Johannes Baptista van Helmont in his *Ortus medicinae* (*The Daybreak of Medicine*, 1648: 41–45). Nonetheless, the persistence and importance of the study of logic is indicated by the fact that even so central a figure to the new natural philosophy of the Royal Society as John Wallis saw fit to compose (probably around 1682) a treatise of logic—and present a copy to that body (now Royal Society MS/76).

Turning from logic to what was unequivocally regarded as philosophy proper, we encounter a potentially major obstacle to our grasp of the subject. Since the nineteenth century, especially in the Anglophone world, a strong distinction has tended to be made between philosophy on the one hand, and the natural sciences on the other. This distinction, moreover, is often retrojected onto the seventeenth century by those writing on it. Yet it risks being seriously misleading, for in that period a major, probably the major, part of philosophy was constituted by the discipline of natural philosophy (*philosophia naturalis* or *physica*). Indeed, often when seventeenth-century authors speak of ‘philosophy’ *tout court*, they mean by it ‘natural philosophy’ (see e.g. Webster 1654: ch. vi). Natural philosophy was not coterminous with modern natural science: it had, for instance, an ambiguous relationship with mathematics throughout much of the period (Dear 1995), and it only came to include natural history under the stimulus of Baconianism (Findlen 2006). What natural philosophy offered was precisely a philosophical—that is, a reasoned—knowledge (*scientia*) of nature, and specifically of ‘body’ (*corpus*) (Blair 2006). In certain hands this knowledge even extended to beings such as angels: for, as the Boate brothers put it, ‘Angels certainly do have a nature’ (*Certe ... Angelos naturam habere*) (Boate and Boate 1641: 2).

The discipline of natural philosophy also comprehended a major, but now rather neglected or misunderstood, part of early modern philosophy: the study of the soul (*anima*) (see further Chapter 12, this volume). Claims about ‘soul’ are now

exclusively the prerogative of theologians, and this perhaps explains the omission of the subject from histories, even comprehensive histories, of natural philosophy in our period (e.g. Park and Daston 2006; but see Park 1988). In the seventeenth century, however, the soul was first and foremost a part of natural philosophy. For not only (p. 25) were the vegetative and sensitive parts of the soul part of nature, it was also the existence of souls that explained sensation, perception, and understanding, and ultimately all life itself. Its further quality of immortality, in the case of the human rational soul, was a helpful (though not entirely uncontested) super-addition to this broader body of philosophical knowledge. Yet natural philosophers throughout the period, from Andrew Willet in his *De animae natura et viribus quaestiones quaedam* (1585) to Robert Hooke in the course of his *Lectures of Light* (c. 1682; published posthumously, 1704: 138–48) knew that it fell to them to explain the nature and powers of the soul. It was only in the eighteenth century that the soul was excluded from natural philosophy and became the foundation of the moral and historical enlightened ‘science of man’ (Serjeantson 2011).

In some ways related to natural philosophy, but consciously distinguished from it in its emphasis on being *qua* being rather than on body, and ultimately distinguished too in its hope that it might provide natural knowledge of the deity himself, was the less prominent philosophical discipline of metaphysics. This subject underwent a resurgence in England and Scotland in the first thirty years of the seventeenth century, particularly under the stimulus of the *Disputationes metaphysicae* (*Metaphysical Disputations*, 1597) by the Jesuit Francisco Suárez (1548–1617) and his protestant followers such as Christoph Scheibler (Krop 1993). In the English universities, metaphysics tended to be concentrated on by those intending to take holy orders (Looney 1981: 12–13), a phenomenon indicated by its absence from the account of his philosophical studies given by Simonds D’Ewes. This was not exclusively the case, however: Suárezian metaphysics remained as important for the physician Francis Glisson (1599?–1677) as it did for his former student, the mathematician, natural philosopher, and presbyterian divine, John Wallis (1616–1703) (Rampelt 2005: 31–36, 69–75). Moreover, despite John Locke’s evident reluctance to act upon William Molyneux’s suggestion that he turn his *Essay concerning Human Understanding* ‘into a body of logick and metaphysics, accommodated to the usual forms’ (Locke 1976–1989: 4, 626; Locke to Molyneux, 23 January 1693), the fact that the suggestion could be made at all indicates the presence of topics inherited from the ‘usual’ school metaphysics in the *Essay* (in book II in particular).

Besides natural philosophy, the other principal part of philosophy was ethics or moral philosophy (*philosophia moralis*; *ethica*). This discipline sought knowledge of the highest good (*summum bonum*) and encouraged the cultivation of the moral virtues, largely conceived through either Aristotelian or Ciceronian lenses. As such it was a discipline that had virtuous action as well as a theoretical understanding of morality as its goal (Prideaux [n. d.]: 284). Moral philosophy also included political philosophy (*scientia civilis*), which considered questions about the form, laws, magistrates, and subjects or citizens of a commonwealth (*respublica*). It also, finally, comprehended *oeconomica*, the doctrine of the household—an important (p. 26) subject in a society in which a ‘family’ might include servants, apprentices, retainers, widows, and collateral kin as well as more immediate relations.

The main criterion of distinction between these two main parts of philosophy turned on the two principal faculties of the soul: the understanding (*intellectus*) and the will (*voluntas*). Natural bodies were not, of course, subject to the contingencies of the human will and hence the philosopher might hope to obtain understanding, even certain understanding, of them. Moral actions, by contrast, depended fundamentally upon voluntary decision, and therefore called for a different mode of philosophical knowledge and presentation. Philosophers in the schools, following Aristotle, therefore commonly distinguished between the ‘contemplative’ knowledge furnished by the theoretical disciplines of natural philosophy and metaphysics and the ‘practical’ or prudential knowledge furnished by the ‘active’ disciplines of moral philosophy and its compeers (e.g. Sanderson 1671: 1–2).

This preliminary framework of the principal disciplines of philosophy does not, however, account for some further major philosophical *genres* in seventeenth-century Britain. Here I shall concentrate on two of these, both of which came to prominence in the latter half of the seventeenth century. The first striking development in English philosophy in particular in the period after 1650 is the increasing prominence of (mono)theistic philosophical apologetics, defending such central

propositions as the immortality of the human soul and the being and attributes of a single omnipotent deity. These philosophical apologies were often pursued in parallel with specifically Christian apologetics, but were distinct from them in so far as philosophers in the period tended to be strongly conscious of the imperative to avoid invoking Scripture in support of philosophical arguments, not least lest atheists ‘boggle’ at it (More 1653: sig. B3<sup>v</sup>). As the revealed status of the Bible began to appear increasingly less self-evident in the century after 1650, philosophers stepped into the breach to assert the compatibility of the ‘light of nature’ with the testimony of sacred history and even (for the most ambitious) with the gospel (e.g. Stillingfleet 1662: bk II, chs. viii–x).

Though this development was relatively new in an English context, it was less so within early modern European philosophy as a whole: philosophical apologetics had constituted a prominent genre in Catholic Europe after the Fifth Lateran Council (1512–1517) had mandated that philosophers demonstrate the immortality of the soul by the light of reason as well as that of faith; and earlier seventeenth-century apologists such as Marin Mersenne, François Garasse (Gregory 1998), and above all Hugo Grotius also offered significant precedent for English endeavours. Early contributors to the genre writing in English were accordingly often conscious that their endeavours might be perceived as lacking originality—which indeed they sometimes were—thereby betraying them into the ridiculous claim that they had forbore from reading other books on the same subject ([Ward] 1652: sig. A2<sup>v</sup>; More 1653: sig. A6<sup>f</sup>).

(p. 27) A number of early English contributions to the genre of philosophical apologetics demonstrate the extension of arts course philosophy into a more public, Anglophone sphere. When Seth Ward (1617–1689) first published his *Philosophicall Essay towards an Eviction of the Being and Attributes of God, the Immortality of the Souls of Men, the Truth and Authority of Scripture* in 1652 he professed that it was written ‘divers years since’ and delivered ‘in a private course of religious exercise’ (Ward 1652: sig. A2<sup>r, v</sup>)—that is, most likely, as a course of college lectures at Sidney Sussex, Cambridge, where Ward had been a fellow until his ejection in 1644 (Henry 2006). In this respect its genesis might be compared to another book on related themes published in the same year, Nathaniel Culverwell’s *Elegant and Learned Discourse of the Light of Nature* (1652) (Greene and MacCallum 1971); both went through several editions over the next thirty years. The early writings of Henry More (1614–1687), similarly defending the existence of God (*An Antidote Against Atheism*, 1653), and *The Immortality of the Soul* (1659) were also the work of one of the very few seventeenth-century English university philosophers who pursued the subject throughout his life, although not as the holder of a chair in the subject.

The other prominent, and rather more original, philosophical development in later seventeenth-century England was the emergence of ‘experimental’ natural philosophy. Whereas in the case of philosophical apologetics there was a direct continuity between its preoccupations and those of the arts course, in the case of the experimental philosophy a clear breach was perceived by contemporaries—notwithstanding the recuperative efforts of some important natural philosophers working within a university context (Wilkins 1654; Ward 1654). ‘Experimental philosophy’, which emerged as a recognizable genre in Britain in the 1660s (Boyle 1663; Power 1664; cf. Casaubon 1669) especially flourished within the ambit of a new philosophical institution, the Royal Society of London for Improving Natural Knowledge. One of the tasks the new Society set itself was to distinguish its (private) activities from the philosophy ‘publicly’ studied in the universities, and by extension to deny that its activities had any consequences for theology. Another was to legitimate the interest of the new philosophy in practical knowledge, arts, and trades (Sprat 1667: 323–31 and bk II). Precisely because of its experimental nature, this new form of natural philosophy posed a profound challenge to the existing conception of natural philosophy, which saw it as contemplative, theoretical, or speculative discipline. The experimental philosophers, by contrast, endeavoured to wrench philosophy away from a hierarchy of intellectual priorities that put the contemplative above the active, the universal above the particular, and by extension what happened ‘all or most of the time’ above particular matters of fact (Dear 2006; Shapiro 1994).

Thus, of all the parts of philosophy, it was natural philosophy that witnessed the greatest transformation in its nature and scope in the course of the seventeenth century. The emergence of experimental philosophy was a Europe-wide development, as Thomas Sprat’s account of the ‘Reputation, and correspondence of the (p. 28) R[oyal] S[ociety] abroad’

indicates (Sprat 1667: 124–29). Yet, prompted by the prominent position that English (and later also Scottish) philosophy held throughout eighteenth-century Europe, it is tempting to suggest that the philosophical culture in seventeenth-century Britain was particularly encouraging of and receptive to the developments that the discipline underwent, in natural philosophy in particular, in the course of the century. Such a broad generalization is no doubt dangerous, yet it may lie behind the developments that led earlier generations of historians of philosophy to emphasize the ‘empiricism’ that they observed among an (admittedly very limited) canon of British philosophers.

## 1.4 The Transformation of Philosophy in Seventeenth-Century Britain

As subsequent chapters will testify, philosophy in Britain developed dramatically over the course of the seventeenth century. These changes took place within the context of a philosophical education in the arts course that was, as we have seen, the wine from which in their youth almost all philosophers sipped. The philosophy of the arts course thereby came to offer a mark against which the flux and reflux of philosophy beyond the schools measured itself. Sometimes this philosophical tide ebbed very far from the preoccupations and priorities of the universities; sometimes the two flowed closely together. But that mark itself also shifted as the century went on. By the beginning of the eighteenth century, Thomas Plume’s 1704 benefaction to Cambridge ‘to maintain a studious and learned Professor of Astronomy and Experimental Philosophy’ indicates that the schools themselves were finding an institutional place for the new forms of natural philosophy which they themselves had helped foster.

Another transformation took place in respect of the language in which philosophy was written. The question of language is central to an assessment of the Britishness of British philosophy. Over the course of the seventeenth century a far-reaching change took place as English, finally though not quite decisively, replaced Latin as the language of philosophy. This was the century in which the largest of the temperate islands of the North-West Atlantic bid adieu, intellectually speaking, to the Latin west and its intellectual legacy. English and Scottish participation in the decisive movements that emerged from that tradition—scholasticism, Renaissance, Reformation—had always been somewhat fitful and in some ways half-hearted; now finally, and sooner than most other European polities, they shed the most pervasive inheritance of the Roman Empire: its language. Whereas at the beginning of the seventeenth century it was exceptionally rare to write (p. 29) philosophy in any language other than Latin, a hundred years later it had become the exception to do so. For some, such as Hobbes in *Leviathan*, the English language served as a means of distancing their philosophy from that of the schools. For others, such as Nicholas Hill at the beginning of the century (1601) and Isaac Newton (*Principia*, 1687) towards the end, writing in what Bacon (1629: 87) called the ‘Generall Language’ of Latin was a necessary means of reaching an audience that was not merely insular. But by the earlier eighteenth century it was a natural decision for the Cambridge philosopher Robert Greene (c.1678–1730) to write what he called his ‘truly English’ (i.e. anti-Cartesian) *Principles of the Philosophy of the Expansive and Contractive Forces* (1727: sig. a4<sup>v</sup>) in that language (though he included at the end a number of Latin *miscellanea philosophica* arising from his teaching in the schools).

These transformations in philosophy are reflected in a development that occurred in the intellectual culture of the two nations as a whole. At the beginning of the seventeenth century, both England and Scotland were, in the context of European learning, intellectual backwaters. Very few of their authors attracted attention in the broader European republic of letters, or were reprinted beyond their native lands. By the beginning of the eighteenth century that situation was undergoing a dramatic change. The ideas of philosophers in England, and shortly also Scotland, were increasingly admired, debated, and imitated throughout a region that was no longer the Latin, and Christian, West, but was becoming enlightened Europe. It was only in this later century that philosophy in Britain lost its function as a natural and necessary preparative to divinity (Levitin 2010: 218–23). Eventually undergraduates would no longer even defend philosophical questions, as Simonds D’Ewes had, in their College’s chapels. But this emancipation came at a cost, for with it was lost the imperial claim of philosophy to comprehend all forms of rational knowledge left unclaimed by doctors, lawyers, and divines.

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## Francis Bacon

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## Abstract and Keywords

This chapter examines the contribution of Francis Bacon to early modern philosophy. It argues that Bacon's work is not limited to epistemology and scientific methodology, and explains that he also wrote treatises on such disparate topics as ethics, politics, aesthetics, religion, and law. The chapter discusses Bacon's theory of matter, his view about the relationship between art and nature, and his critique of the anthropocentric view of the universe. It also highlights his belief on the importance of understanding the difference between the unaware perception of nature and the sentient awareness of human knowledge.

Keywords: Francis Bacon, modern philosophy, ethics, politics, aesthetics, religion, law, theory of matter, perception of nature, human knowledge

## 2.1 The Meaning of 'Philosophy'

BACON was born in 1561 into a culturally and intellectually rich family environment. His father, Sir Nicholas Bacon (1510–1579), Lord Keeper of the Seal, had been an influential figure at court during the reign of Queen Elizabeth I, while his mother, Lady Ann Coke (*c.* 1528–1610), daughter of the renowned humanist Sir Anthony Coke, tutor to Edward VI, was a very learned woman with a strong Puritan ethos. From the very beginning of his political and intellectual career, Bacon tried to combine the roles of active involvement in the administration of the State with cultural leadership in the field of natural philosophy. In politics he rose through the higher ranks of civil service: Solicitor General (1607), Attorney General (1613), member of the Privy Council (1616), Lord Keeper of the Great Seal (1617), Lord Chancellor, Baron Verulam (1618), and Viscount St Alban (1621). Having fallen into disgrace due to charges of corruption and bribery, he retired to a private life of writing and experimentation until he died in 1626. Science and politics are therefore inseparable aspects of his work. In traditional accounts of early modern philosophy, Bacon's contribution has often been confined to the field of epistemology and scientific methodology, but his engagement with philosophical ideas was in fact wider and richer. He wrote on such disparate topics as ethics, politics, law, aesthetics, and religion. Besides expressing his philosophical view in treatises of exquisite style, written according to the most recent trends in literary fashion (*Essays* (1597, 1625), *De sapientia veterum* (1609), and *New Atlantis*, written in 1623 and published posthumously in 1627), Bacon expounded his programme of (p. 42) universal reformation of human knowledge in such far-reaching works as *The Advancement of Learning* (1605), *Novum organum* (1620), and *De dignitate et augmentis scientiarum* (1623).

In a letter to his close friend Lancelot Andrewes, written in 1622, Bacon presented his 'Great Instauration' as a project

leading to the material and spiritual renewal of the human condition and to the full recovery of matter's natural powers—the 'general good of men in their very being, and the dowries of nature' (SEH 14: 373). *Instauratio* (restoration, recovery, renewal) is a key word in Bacon's natural philosophy. It means, first of all, the restoration of matter. (The idea that matter can undergo a process of self-renewal hinges on the fundamental Baconian tenet that matter and nature are everywhere and always the same.) This 'instauratio' of matter—constantly occurring in nature and, in principle, replicable by human technology—represents the ontological counterpart to the 'great instauratio' of human learning (*instauratio scientiarum*), which Bacon pursued throughout his life as a project of material betterment, ethical reform, and political stability. In *De sapientia veterum*, in the fable of 'Orpheus', Bacon describes the principal aim of natural philosophy as 'the restitution and renovation of things corruptible, and (what is indeed the same thing in a lower degree) the conservation of bodies in the state in which they are, and the retardation of dissolution and putrefaction' (SEH 6: 647–8, 721). *Restitutio* is the subtitle of the fable 'Deucalion', which obliquely argues that human beings can have hope of renewing things in perpetuity only when they grasp the ultimate, most common foundations of reality (SEH 6: 661–2, 737). In Bacon's universe, the opposite of instauratio is putrefaction. Matter and knowledge are constantly threatened by self-decomposition: 'like as many substances in nature which are solide, do putrifie and corrupt into wormes: So it is the propertie of good and sound knowledge, to putrifie and dissolve into a number of subtile, idle, vnwholesome, and (as I may tearme them) vermiculate questions' (OFB 4: 24). 'Instauratio' also has a further, ethical meaning in Bacon's philosophy, since the 'reformation' of the mind is a crucial premise of the whole project (OFB 4: 50). Politically speaking, 'instauratio' means a restoration of political energies, a principle which relies on Machiavelli's notion that the regeneration of states should recover the ideals of republican freedom and virtue (*reformatio* and *reductio ad antiquos mores*) (SEH 1: 541). Finally, there is also a theological meaning of 'instauratio' in Bacon's philosophy. As a convinced Protestant, Bacon has no doubt that, in the very 'age of our selues', God's providence has decreed that 'there should attend withall a renouation, and new spring of all other knowledges' (OFB 4: 37). *Antiquitas seculi iuventus mundi*, he claims: the greater the time elapsed, the younger the age of the world. In this splendid motto from the *Advancement of Learning*, Bacon perfectly captures the foundation of his philosophy and of his views on time, providence, and reason (OFB 4: 29). The restoration of the immemorial past coincides with the renewal of the human condition, and such a renewal relies on (p. 43) the power of knowledge to recover and harness the inexhaustible energy of matter. For Bacon, the greatest argument in favour of the pursuit of knowledge is the very self-restoring nature of the mind's activity: 'of knowledge there is no sacietie, but satisfaction and appetite, are perpetually interchangeable'; even knowledge preserved in books, Bacon adds, is 'capable of perpetual renovation' (OFB 4: 52–3). Parallel to the self-restoring nature of the human mind is the self-restoring nature of matter's innermost motions, its appetites.

Philosophy for Bacon is first and foremost an attempt to restore the life of mortal bodies (*experimentum corporis mortalis restituendi*). Orpheus is the principal emblem of philosophy in that his music has the power both 'to propitiate the infernal powers' and 'to draw the wild beasts and the woods'. Bacon interprets these two actions as signifying natural and moral philosophy respectively (SEH 6: 647–8, 721). Since the 'experiment' of renewing mortal life is likely to be frustrated due to the technological shortcomings of human knowledge, philosophy, like Socrates in fifth-century Athens, tends to turn its attention to the sphere of *res civiles*, to ethical and political matters (SEH 6: 648, 722). In Bacon's opinion, however, philosophy has a privileged relationship with matter and with the reality of its transformations, both actual and virtual. In *Descriptio globi intellectualis*, he defines 'philosophy' as the exercise in which 'the mind is bound to things' and to their causal determinism (*nexus*), whereas in history and poetry the mind enjoys a certain degree of freedom, both of a descriptive (*historia naturalis* and *civilis*) and fictional character (*historia ficta*). To philosophize, he explains further in the same work, is to inform the human mind with notions of substance and of qualities, following natural and necessary reasons and rejecting all frivolous superstitions which have been received from past traditions (OFB 6: 96–7, 110).

Bacon uses different emblems to represent philosophy and its relationships with the various provinces of learning (*scientia*).<sup>1</sup> As stated above, philosophy is symbolized by Orpheus, whereas learning is portrayed as the Sphinx. By 'philosophy' Bacon means a higher, broader understanding of things, one capable of reconciling limited, conflicting points of view; in its harmonizing efforts it works as a remedy and a consolation. Knowledge of nature, by contrast, is portrayed as a monster that, like the Sphinx, haunts our life with questions and experiments. The Muses, who in Bacon's emblematic philosophy

stand for the activity of pure contemplation, represent the link between philosophy (Orpheus) and the knowledge of nature (Sphinx). It is only when knowledge needs to find practical application that the pleasure of contemplation becomes the torment of unsolvable riddles. Although unavoidable, this transition from contemplation to practice is always represented as a cruel and unnatural passage in Bacon's work. (p. 44)

Sphinx proposes to men a variety of hard questions and riddles which she receives from the Muses. In these, while they remain with the Muses, there is probably no cruelty; for so long as the object of mediation and inquiry is merely to know, the understanding is not oppressed or straitened by it, but is free to wander and expatiate, and find in the very uncertainty of conclusion and variety of choice a certain pleasure and delight; but when they pass from the Muses to Sphinx, that is from contemplation to practice, whereby there is necessity for present action, choice, and decision, then they begin to be painful and cruel; and unless they be solved and disposed of, they strangely torment and worry the mind, pulling it first this way and then that, and fairly tearing it to pieces (SEH 6: 679, 756–7).

In the *Advancement of Learning*, Bacon rejects what he calls the 'Socratic' way of doing philosophy, 'to call Philosophy downe from heauen to conuerse vpon the earth', 'to leaue naturall Philosophie aside, and to applye knowledge onely to manners, and policie'. Here Socrates represents the kind of philosopher who is concerned solely with the world of human affairs and questions of an ethical and political nature. Bacon, by contrast, maintains that both 'heauen and earth doe conspire and contribute to the vse and benefite of man' (OFB 4: 32). His 'instauration' aims to restore precisely such an original bond between human beings and their world, the soul and the body, Orpheus the discoverer of celestial harmonies and Orpheus the enchanter of the human appetites.

Bacon subdivides his philosophical system into three parts which correspond to the three ontological domains of God, nature, and man. This tripartite division mirrors the different ways in which the three 'objects' are reflected in the human mind: nature through a 'direct ray', God through the 'refracted ray' of the creation, and man through the 'reflected ray' of self-knowledge (SEH 1: 540). Strictly speaking, human knowledge of reality is not direct, but rather a kind of 'knowledge acquired' and as such should be called 'learning'; only knowledge 'in God' is 'originall' and is called 'sapience' (OFB 4: 33). At the basis of all varieties of human learning, Bacon posits a general, fundamental form of knowledge, i.e. 'first philosophy'. He justifies the worth and usefulness of this *philosophia prima* by stating that knowledge cannot progress without making an attempt to reach a universal consideration of things (OFB 4: 30). Bacon therefore divides metaphysics into two parts, one dealing with the ultimate beings of nature and the other with the most general properties of things. One represents the foundation of all other disciplines, a single trunk (*unus truncus*) from which all branches of learning spread and which thus remains the repository of the most universal axioms (SEH 1: 541). Bacon compares this notion of metaphysics as an investigation into the ultimate, real forms of nature (*naturae vestigia aut signacula*) impressed on different types of matter to what he describes as the Persian version of magic, which established a correspondence between the ultimate structures of reality (*architecturae et fabricae*) and their symbolical counterparts in the realm of natural and political phenomena (*rerum naturalium et civilium symbolizantes*) (SEH 1: 542–3). The second part of Bacon's metaphysical knowledge deals with the most abstract (p. 45) attributes of reality (*transcendentes conditiones*) such as 'Like' and 'Different', 'Possible' and 'Impossible', 'Being' and 'Non Being'. Bacon argues that discussions of such metaphysical concepts play an essential role in orienting and guiding research in natural philosophy. The philosophical investigation of beings that participate in different natures (*participia*), for example, helps us to understand the essence of those 'ambiguous species' which waver between more defined classes of natural things, such as living beings that hover between putrescent and vegetable life, or beings that exist halfway between creatures that are generated through spontaneous generation and creatures that are reproduced through seed. Another instance of metaphysical notions which Bacon finds worthy of exploration is the concept of attraction (*similia similibus gaudent*) (SEH 1: 543–4).

## 2.2 Bacon's Theory of Matter



Bacon's natural philosophy rests predominantly on a materialistic conception of the universe, in which matter is considered a single, vital substratum pervaded by varying degrees of activity corresponding to varying levels of material texture (from ether to sulphur, from elemental substances to stable configurations of matter). In this conception, the ultimate source of energy in matter is represented by a limited number of primordial appetites, each appetite characterized by the same fundamental tendency to self-activity and self-preservation. As a tendency to self-activity and self-preservation, an appetite is a form of adaptive drive endowed with the ability to discriminate between what is conducive to its own survival and what leads to its own destruction. Bacon calls such an ability perception (*perceptio*), and describes it as a tendency that is uniformly distributed in matter. This means that for Bacon matter is inherently alive. The next level of activity after perception is 'sensation' (*sensus*). Sense awareness is the defining feature of animal nature, presupposing various degrees of conscious knowledge. The difference between perception and sensation is the same fundamental difference which distinguishes the simple urge of material appetite from the level of knowledge that is capable of controlling the primordial appetitive drives of matter. In this sense, learning (*scientia*), in all its forms, is a natural evolution of the tendency to self-preservation embedded in matter, different from this in degree but not in kind. If *perceptio* is the discerning tendency inherent in the original desires of matter, then *sensus* is an awareness of animal desires and aversions, while learning (*scientia*) is knowledge of reality acquired through experience. Different from all these forms of knowledge is God's original self-knowledge (*sapientia*), which is the very (p. 46) essence of things, their blueprint. The movement from animal awareness (*sensus*) to learning (*scientia*) is the process that Bacon calls 'induction'. Starting from sense perception, inductive knowledge draws general and stable templates of experience from particulars and individuals. In this sense, individuals are the 'prime matter' of science.

Since Bacon assumes that an original bond connects knowledge, matter, and life, he considers man-made transformations of nature to be part of the same universal activity of nature itself. Only by obeying nature's laws, that is, can man hope to alter and transform it. Human technology (*sapientia mechanica*) is thus a product of both nature and time in so far as man's mind both imitates the way vital, self-preserving appetites adjust to the material conditions of ever-changing nature and simultaneously takes advantage of nature's adaptations. Given such a strong emphasis on the role and centrality of matter and nature, the progress of human knowledge and its practical applications involve a firm rejection of all forms of anthropocentrism and anthropomorphism. Bacon maintains that in organizing the tangled and farraginous material of natural likenesses—the fundamental method through which knowledge is gathered and developed—natural philosophers should shift the focus of their productive inferences and analogies from the human mind (*analogia hominis*) to the world (*analogia universi*). Left to its own devices, intellectual creativity (*ingenium*) marks the end of true knowledge and the beginning of a delusional distortion of reality. For the mind to have unfettered access to reality, therefore, it is necessary for it to undergo a preliminary treatment of all the preconceptions (*anticipationes*), fictions (*idola*), and verbal misapprehensions (*verba*) which might adulterate the original kinship between perception and matter, mind (*mens*) and reality (*res*). Nevertheless, it is important to emphasize that, despite this attention to the mind's weaknesses and fallibilities, Bacon's 'great instauration' of matter, nature, and humankind relies on an essentially optimistic view of the powers of human knowledge, and of the abilities of these powers to produce a true account of reality. Realism, both ontological and gnosiological, is the dominant, constant idea behind Bacon's philosophy. One of the fundamental meanings of 'instauration', in fact, is the restoration of the prelapsarian condition of transparency between being and knowledge. In Bacon's physico-theology, the Fall introduced an element of 'reluctation' into nature (the self-interested appetites of matter) and a tendency towards self-deception in the mind of man. In Bacon's philosophy, then, realism does not only mean a belief in the accessibility of truth and the possibility of restoring the original partnership (*societas*) between the human mind and natural things. It also means a disillusioned and disenchanted attitude towards the force of natural and human appetites. In this sense, Bacon has a deeply political conception of natural philosophy. For him, natural order is based on precarious, constantly changing settlements—treaties, as it were—between appetites which are incessantly in conflict. Reason, therefore—whether natural (p. 47) (light of nature), human (method and technology), or divine (providence)—needs to be a cunning negotiator, proceeding obliquely in order to be able to preserve the system of natural forms.<sup>2</sup>

Bacon uses a number of emblems—Pan, Proteus, Cupid, Ocean, Saturn, Proserpina—to refer to the notion of matter, its

properties, and its countless transformations. Such a wealth of emblematic representation is not surprising if we think of the important role that matter plays in Bacon's philosophy. With the exception of God, Bacon writes in *De sapientia veterum*, matter is the oldest being in nature (SEH 6: 651, 725), always the same in the universe (OFB 6: 11). Bacon repeatedly praises Democritus, therefore, for having discovered the principle of the eternity of matter. Foreshadowing an interpretative strategy that would become the lynchpin of Ralph Cudworth's *True Intellectual System of the Universe* (1678), Bacon considers Democritus and his theory to be closer to the letter of the Bible than Plato and Aristotle, who defended the principle of the eternity of the world—that is, the eternity of *formed* matter—rather than the eternity of matter in and of itself. The difference is a fundamental one. According to Bacon, Democritus assumed that matter was a fully-fledged ontological being without the need of any form, just as Bacon himself believed matter to have existed without any form before the six days' work of creation. Plato and Aristotle, by contrast, understood the world to be a perfect combination of form and matter from the very beginning, and thus treated matter as a defective and incomplete ontological state compared to form. In *De sapientia veterum*, in the fable of 'Coelum', Bacon explains in clear, Lucretian terms that the universe resulted from accidental material motions, which initially produced 'imperfect and ill-compacted structures of things [*imperfectae et male cohaerentes compages*], which would not hold together,—mere attempts at worlds [*veluti tentamenta mundorum*]', until a stable frame of matter—a *fabrica*—came out of the unremitting process of trial and error (*quae formam suam tueri et conservare posset*) (SEH 6: 723–4). The fable of 'Coelum' illustrates Bacon's cosmogonic ideas, with their emphasis on vicissitude and changeableness. Most of all, it expands on the distinctively Baconian concept of precarious harmony, seen as the best possible arrangement of things in nature given the existence of a plurality of conflicting principles.

In *De sapientia veterum*, the fable of Proteus symbolizes the two principal conditions (*facies*) of matter: matter in a state of freedom, with its ordinary structures (*structurae et fabricae specierum ordinariae*), and matter forced to produce any number of astonishing transformations under the constraint of human art (SEH, 6: 652, 726). Matter's changing states of freedom or constraint also account for Bacon's partition of natural history into different governments (*regimina*) of nature. The 'government' based on freedom, in which nature spontaneously pursues its (p. 48) appetites (*ipsa natura per se nititur*), is the subject of the 'history of generations' (*natura libera*). The 'government' based on nature's resistance to antagonisms within the very core of matter (*pravitates and insolentiae materiae contumacis et rebellis*) provides the material for the 'history of pretergenerations' (*natura perturbata*). Finally, the 'government' of restraint, when nature is regulated and transformed by human art, represents the domain of the 'history of arts' (*natura constricta*) (SEH 1: 496; OFB 6: 8, 100–3). The history of nature in its unconstrained state is further divided into five parts: history of the ether, history of the regions of the air, history of the earth and sea, history of the greater masses of matter (the elements) and, finally, history of the lesser masses (natural species) (OFB 6: 109). In some sense, then, free nature and constrained nature represent the two poles of Bacon's philosophy. Matter in its condition of liberty constitutes the sphere of natural wisdom, which is nature's own purposive knowledge (light of nature) whereby it channels the force of its material appetites into the production of natural things. Matter in its state of constriction constitutes the sphere of mechanical wisdom, through which human beings imitate and exploit nature's knowledge in order to advance the state of their technological expertise. In both cases, nature and human beings attempt to circumvent and control the violence and unruliness of the primeval appetites of matter by applying strategies of circuitous reason.

The cosmological framework of Bacon's natural philosophy draws on the principles of Bernardino Telesio's physics (as Bacon himself acknowledges on more than one occasion) (Giachetti Assenza 1980). An Italian philosopher of the late sixteenth century who produced one of the most systematic and rigorous critiques of Aristotelian philosophy during the Renaissance, Telesio intended to replace Aristotle's hylomorphic understanding of nature (in which all transformations of matter were explained as processes of formal actualization of material potentiality) with an evolutionary theory of matter based on the constant battling of two opposite active principles, heat and cold. Telesio's natural system rested on the central idea that the tension created by original oppositions was responsible for the self-activity and self-maintenance of the universe. His universe was thus intrinsically bipolar, based on an ordered arrangement in which the greatest concentration of matter was located at the centre of the universe and the greatest rarefaction was relegated to the universe's farthest

reaches; on cold, darkness, and denseness inside the earth, and heat, light, and rarity emanating from the sun; on absolute rest in the most concentrated material part of the universe and absolute mobility in the celestial bodies (OFB 6: 178). It is from Telesio that Bacon acquires his insistence on the materiality of natural processes; the idea of energy as a source of activity which comes about through structural oppositions inherent in the very system of nature; the notion of material self-preservation; and the assumption that both material and human appetites derive from the same natural source. Above all, Telesio is the inspirer of Bacon's notion of spirit.

(p. 49) The ratio between the quantity of matter (*copia* or *paucitas*) and its expansion (*exporrectio*) determines the principal differences between the states of matter, i.e. between tangible bodies on the one hand and pneumatic bodies on the other. The range of pneumatic bodies is wide: ethereal and sidereal substances in the higher regions of the universe, air and flame in the atmosphere around the earth, water and oil on the earth itself, and, lowest of all, mercury and sulphur in the earth's innermost depths (OFB 6: 173). Bacon divides sublunary bodies into two large groups: greater and lesser masses of matter, which he also calls greater and lesser 'colleges of things' (*collegia rerum*). In Bacon's universe, the four elements of the Aristotelian tradition have no special ontological status. They are not actual principles (*exordia rerum*), that is, but simply larger gatherings of connatural bodies. The difference between the greater masses of connatural bodies and the lesser ones, which Bacon also refers to as species, depends on the nature of their matter: in the former case, matter is homogeneous and continuous; in the latter, dissimilar and organic. Given the variety of pneumatic and tangible bodies in the universe, the notion of 'texture' (*textura*) plays a crucial role in Bacon's theory of matter (OFB 6: 108–9). The highest form of rarefied matter is spirit, which is also the most active. In keeping with the principles of Telesio's physics, spirit represents the energetic core of a body. The specific state and shape of matter depends on the way in which the spirit dwells in a portion of matter, on how impatient such a spirit is to find a way out, or how leisurely it enjoys its stay within. Spirits can be detained inside a body through forced obstruction (*constipatio* or *obstructio*) or through the spontaneous assimilation of a suitable fuel (*ministratio proportionati alimenti*). In *De sapientia veterum*, spirit is symbolized by Proserpina, for 'all the growths of our upper world' derive from and in the end return to 'that rich and fruitful supply of active power subsisting in the underworld' (SEH 6: 681, 759).

## 2.3 Atomic Appetites

Matter is pliant (*plica materiae*) (OFB 11: 414) and changeable (*fluxa*) (OFB 6: 12, 177) according to Bacon. It has the ability to expand and contract, and the frequency and extent of such unfolding and enfolding (*explicatio* and *implicatio materiae*) depend on its appetites (OFB 6: 13). Bacon's natural bodies are thus particular concretions of matter whose level of 'texture' depends on their underlying, shaping appetites. Bacon calls these appetites the 'cardinal' or 'catholic' 'virtues' of matter—'dense', 'rare', 'light', 'heavy', 'hot', 'cold', 'consistent', 'fluid', and so on—and he sees them as a limited number of original, primeval desires inherent in matter (OFB, 6: 108–9; 11: 38). The whole range of natural motions (p. 50) extends from one extreme of perfect mobility to the other of absolute rest. The rotation of the heavenly bodies is an instance of unremitting motion in the universe. It is caused by a kind of appetite which 'moves merely for the sake of moving and following itself, of seeking its own embraces, and of exciting its own embraces, and of exciting its own nature and enjoying it, and of exercising its own operation'. Rectilinear motion, by contrast, is 'like a journey to an end, and to move towards a point of idleness or rest, for the sake of achieving some object and then abandoning its motion' (OFB 6: 178). The *Novum organum* records nineteen original appetitive tendencies in matter: motions of resistance, of connection, of liberty, of hyle, of continuity, of profit and want, of greater and lesser congregation, of magnetism, of flight, of assimilation, of stimulation, of impression, of configuration, of 'passing through', of royalty or politics, of rotation, of trepidation, of rest (*decubitus*) (OFB 11: 382–416). Such appetites are of a limited number and are inherent in material bodies. The motion of resistance (*antitypia*), for example, is as natural and universal as any other appetite of matter: 'wherever a natural body is set', he argues in *Thema coeli*, 'there also is resistance, and that in proportion to the body' (OFB 6: 187). What is more, these appetites of matter are everywhere in nature, for Bacon insists on characterizing nature as a uniform and continuous being. Nature, he argues in *Descriptio globi intellectualis*, is one and the same (*una et eadem*) in every part of the universe, both

in the ethereal regions and in the sublunary world. The same appetites of contraction and expansion, attraction and repulsion which govern the motions of the earthly bodies thus rule the motions of the celestial bodies as well (*desideria materiae in utroque globo*). The study of nature, Bacon points out, should be based on physical reasons (*physicae rationes*), and by physical reasons he means ‘those appetites of matter which no difference of regions or places can divide or put asunder’ (OFB 6: 112–13).

Appetites are also fundamental to an understanding of Bacon’s characteristic views on natural order and providence. His notion of cosmic consent in nature (*consensus rerum*) is based on the idea that order—precarious though it may be— involves a multiplicity of conflicting appetites. Every individual being in nature is the result of a more or less unstable arrangement of appetites, each body being ‘endowed with many motions, some ruling, others submitting, others again lying hidden unless excited’ (OFB 6: 189). Thus, if there is a sense in which one can legitimately speak of an atomic constitution of matter in Bacon, this constitution has to do with its innermost material desires. In all likelihood, it is due to the ontologically elusive status of the atom—and especially of the meaning of the atom as appetite—that Bacon decided to provide an emblematic reading of the question by using the mythological figure of Cupid. In *De sapientia veterum*, in the fable entitled ‘*Cupido, sive atomus*’, Bacon explains that the myth of Cupid refers to the origins or ‘cradles’ (*cunabula*) of nature. Cupid is ‘the appetite or instinct [*stimulus*] of primal matter or, to speak more plainly, the *natural motion of the atom*’, which is the same as saying ‘the original and unique force that constitutes and (p. 51) fashions all things out of matter’ (SEH 6: 655, 729). Due to the numerous contradictory accounts of Cupid’s persona given by the ancients, Bacon tells us, he will focus only on those traits on which the great majority of authors have agreed: Cupid is the most ancient god, born without parents, coming from an egg laid by the Night, with a distinctive individuality, an eternal infant, naked, winged, armed with a bow and blindfolded. Cupid’s timeless age represents the immemorial antiquity of matter. He is parentless because no first principle can be derived from another principle. ‘God always excepted’, Cupid himself is the cause of causes. In the language of scholastic philosophy, he is *causa sui*, self-cause. Indeed, looking for Cupid’s parents is a symptom of philosophical frivolity. ‘Nothing has corrupted philosophy’, Bacon argues, ‘as much as this inquiry about *Cupid*’s parents’ (OFB 6: 198). Having no cause, Cupid’s origins are necessarily obscure. Even more obscure is his way of being (*modus perobscurus*), an obscurity that Bacon attempts to convey through the image of Cupid as ‘hatched from an egg laid by the Night’, which refers to our mind’s inability to grasp the obscure force that pervades each particle of matter. As a result, the knowledge we have of the appetite of matter is negative and ‘nocturnal’. Cupid is an archer in that the atom acts at a distance. Finally, Cupid is represented as blindfolded because the appetite of the atom is blind, completely engrossed in its own pursuit of instantaneous gratification (SEH 6: 656, 731).<sup>3</sup>

## 2.4 From Appetites to Induction

Appetites are tendencies, and as tendencies, they always aim at a target, however immediate and self-centred this target may be. The level of an appetite’s immediacy and self-centredness corresponds to the level of awareness that accompanies the fulfilment of its target. Natural tendencies, then, are more or less aware of their activity, depending on the degree of their materiality. For Bacon, the examination of the difference between the unaware perception of nature (*perceptio*) and the sentient awareness of human knowledge (*sensus*) is a matter of the utmost philosophical importance (*res maxime fundamentalis*), a most sublime principle (*res nobilissima*). All natural bodies, Bacon states, are endowed with a manifest power of perception (*vis percipiendi*), a discerning and elective faculty capable of distinguishing between—and therefore of choosing or avoiding—useful and harmful things. To explain this faculty in greater depth—and he does so in great detail in both *De dignitate et augmentis scientiarum* and *Sylva Sylvarum*—Bacon adduces such examples as attractions between magnets and iron, flames and naphtha, (p. 52) bubble and bubble; between light and white bodies, the operations of assimilation and excretion in the process of digestion, the ways sponges attract water and expel air, and so on (SEH 1: 610; 2: 602). There can be no process of transformation among natural things, he makes clear, if these things are unable to perceive each other (*perceptio reciproca*): ‘There is perception everywhere’ (*ubique ... est perceptio*). Such mutual and innate perception between natural bodies is subtler than any of the human senses. Air, for instance, perceives heat and cold

more acutely than human touch, which is nevertheless taken as the standard of our judgement between heat and cold (*qui tamen pro calidi et frigidi norma habetur*) (SEH 1: 610).

Bacon describes this process of natural, discerning perception as wholly absorbed in the attainment of immediate and self-interested gratification. He does not consider natural perception a form of anticipatory knowledge, that is, capable of foreseeing future developments or recollecting previous experience. The fundamental point of distinguishing between perception and sensation, then, is that such a distinction prevents natural philosophers from embracing false views concerning the world of inanimate beings, such as the thesis that inanimate beings are endowed with sentient powers or that the world is animated by one universal soul. The ancients (and their Renaissance revivers) were unable to see how there can be a discerning motion (*motus cum discretione*) without sensation and how, further, there can be sensation without a soul (SEH 1: 610–11; see Levi 1925). For Bacon, by contrast, *discretio* is a tendency within matter that is prior to the emergence of sense perception in the organs of the animal soul. This also means that knowledge is present in the very roots of matter and does not require the emergence of the human mind to make its appearance on the face of the universe. The foundation of knowledge is material motion, an atomic, appetitive tendency to satisfy an immediate urge, and the material motion *par excellence* is any form of inductive inference whereby individual appetites turn into appetites of universal knowledge. Here it is important to keep in mind that induction remains a tendency that is an essential part of the very appetitive nature of matter. The inductive tendency towards the fulfilment of increasingly comprehensive ends is itself ‘interested’, for the idea that there could be a disinterested urge to contemplation in nature is completely foreign to Bacon’s universe, on every level of the philosophical progression from perception to learning. If induction were not a kind of appetitive tendency itself, the enterprise of ‘restoring’ knowledge and life would end in a limbo of dreams and unfulfilled expectations. This is a key point for Bacon. Real appetites are appetites that belong to real individuals and real species; fictional appetites are imaginary representations of reality, tendencies to self-delusion, *idola*, philosophical and theological ‘fables’.

That Bacon’s notion of induction is rooted in the very self-organizing activity of nature becomes even more apparent when we examine the intellectual context of Bacon’s notion of matter and appetite. The half-Telesian, half-Stoic notion of a perfect order in nature which comes about through the irrepressible tendency to (p. 53) self-preservation is behind Bacon’s concept of induction. Bacon maintains that the tendency to adapt—a tendency shared by all natural beings—evolves naturally from matter’s immediate perception and discretion of vital and harmful things (the ‘particular’) to a broader and more controllable grasp of reality (the ‘general’). Knowledge is a natural being’s vital response to its environment and, in humans, such a response may develop and eventually become the ability to make a fully-formed inductive inference. New inventions are often the result of chance discoveries caused by the accidental satisfactions of appetites and their contribution to the self-preservation of the organism. Prometheus discovered fire by chance, accidentally striking flint against a stone. In this, he was not different from any other animal finding a successful way of preserving its own being: ‘here no other method of invention is proposed than that which the brute beasts are capable of and frequently use; which is an extreme solicitude about one *some thing*, and perpetual practising of it, such as the necessity of self-preservation imposes on such animals’ (SEH 4: 409). Bacon describes this shift from accidental discoveries to rational extrapolations grounded in reality as a form of translation, a ‘translation from nature or chance into an art’, as is witnessed by all those cases in which ‘mechanical arts have sprung from small beginnings presented by nature or chance’ (SEH 4: 416). Knowledge is therefore a natural product of the life of matter and it originates from ‘the necessity of self-preservation’. Induction, which in its most sophisticated form is a systematic attempt to control appetites and anticipate the motions of nature through increasingly more general representations of reality, maintains a natural link with appetite because, like any other form of knowledge, it grows out of the very appetite for self-preservation. ‘[T]he sciences themselves’, argues Bacon, ‘are extracted out of particular instances, partly natural partly artificial, as the flowers of the field and the garden’. And he adds the crucial remark: ‘the mind does of herself by nature manage and act an induction much better than logicians describe it’. The goat that cures its wounds by eating dittany is practising inductions better than the logician who explains induction as the result of meaningless enumerations (SEH 4: 408–10).

Induction is the most reliable form of adapting to the life of nature. Considering that knowledge is first and foremost a form



of reactive adjustment to reality (*res*), and considering further that reality is in a state of constant flux (*plica materiae; materia fluxa*), a cognitive response which can adequately respond to such a changing reality must be sufficiently flexible and sophisticated to be able to move beyond the immediate perception of things in their physical, positive presence. Just as life cannot be maintained without successful reactions to harmful experiences, so, too, there can be no knowledge without successful responses to mistakes and contradictions. In terms of inductive logic, knowledge cannot simply come about through mechanically confirming and reconfirming the present, immediate, physical datum of experience (the so-called induction through simple enumeration and repetition of similar, positive cases, *inductio per enumerationem simplicem*) (OFB (p. 54) 11: 30, 110), but rather needs to reintegrate the absent, the negative, and the contradictory case into a reasonable and faithful representation of the continuum of experience. '[T]o conclude upon a bare enumeration of particulars (as the logicians do) without instance contradictory', Bacon explained, 'is a vicious conclusion; nor does this kind of induction produce more than a probable conjecture'. For, he continues, 'who can assure himself, when the particulars which he knows or remembers only appear on one side, that there are not others on the contrary side which appear not?' (SEH 4: 410; OFB 11: 82). Bacon is fully aware that the human intellect is moved more by positive than negative cases, but he also knows that the force of negative instances is greater (and in the long run more rewarding in terms of knowledge) than any positive confirmation of nature's status quo (OFB 11: 84). This point is of central importance to Bacon's philosophy and betrays his characteristic anxiety concerning the advancement of reliable knowledge. True induction, he declares, pre-emptly any possible shortcoming which might come about from raw experience and untested expectations. Here the extent to which Bacon's philosophy is about control comes to the fore. Control requires the ability to discern (*perceptio*) between negative and positive instances of experience. What is more, the ability to control sets of particular instances leads to the discovery of 'forms', that is, tested, controllable, and replicable patterns of experience: 'wherever a case is established of negation, privation, or exclusion, there is some light given towards the invention of Forms' (SEH 4: 419).

Although induction is the culmination of natural knowledge, man needs to overcome a parallel tendency in his mind to privilege positive over negative instances. Such a tendency, which Bacon characterizes as one of the most pernicious misapprehensions based on human nature ('idols of the tribe'), is the tendency to believe the results of inductions based on regular recurrences of similar cases (*inductio per enumerationem*) (SEH 4: 432). Being reconfirmed in one's original assumptions is simply another way of remaining embroiled in one's own fantasies, and being positively reconfirmed in one's imagination of reality is the greatest obstacle to the progress of one's knowledge of it. Instead of betraying a genuine, natural appetite for reality, the positive reinforcement of experience represents an appetite for fictional reality. For Bacon, one way of controlling the tendency to self-delusion which is characteristic of human nature, is to subject knowledge of nature to mechanical apparatuses of trial and proof. The transition from natural knowledge to mechanical knowledge is therefore an essential stage in the very evolution of natural life (moving from immediate appetites to purposes of a greater scope) and it represents the human attempt to exercise forms of methodical and artificial control of anomalous behaviour in nature. Legitimate induction seamlessly leads to technological applications. In this sense, as Bacon writes in *Phaenomena universi*, artificial things are 'the most trustworthy interpreters of natural things': one can only truly understand the nature of lightning when one knows how to produce pieces of artillery (OFB 6: 9). Machines and all other devices (p. 55) of artificial knowledge, logic, and life may be characterized, from this point of view, as inductive contrivances.<sup>4</sup>

## 2.5 Cupid, Vulcan, and Minerva, or the Relationship between Art and Nature

What Bacon calls 'translation' from nature or chance (which are identical given his view that appetites of matter are blind) to art is part of the process through which the natural perception of matter evolves into human learning. Art is a form of nature's activity; more specifically, it is natural activity held in check by human action (*natura constricta*). One of the most important distinctions in Bacon's organization of learning is certainly the one between speculative and practical philosophy, the first dealing with the 'investigation of causes', the second with 'the production of effects' (SEH 1: 547). Human knowledge should aim at practical targets ('to command nature in operation') (SEH 4: 411). Such a view, however, does not

imply any primacy of art over nature. Reading backwards from Hobbes and Vico, one might be led to think of Bacon as a philosopher of pragmatism *ante literam*, for whom nature is merely what we make of nature. In fact, for Bacon, the exact opposite is true: we are what nature allows us to make of its universal power. Art is nothing but a controllable extension of natural productivity. Parallel to his critique of Renaissance *ingenium* in the domain of discussions about method is Bacon's attack on the characteristically Renaissance notions of art as a supplement, amendment, or perfecting of nature (SEH 1: 496). Bacon claims that 'artificial things differ from natural things not in form or essence, but only in the efficient', which means that the only power human beings have over nature is that of inducing external motions in matter (i.e. to move natural bodies either closer to or farther from the operator, to use Bacon's words), while 'nature does the rest by and within itself'. Men have direct control of local motions (in this Bacon can be seen as a mechanical philosopher *in nuce*), but only nature has immediate control over the innermost motions of matter, i.e. its primordial appetites. Human art is therefore a small province of nature, which is 'one and the same' throughout the universe (OFB 6: 102–3).<sup>5</sup>

(p. 56) In his effort to mechanize and standardize the otherwise spontaneous and random course of knowledge, Bacon shows no interest in the typical Renaissance glorification of the powers of human creativity. Talent and individuality, in his opinion, are often an obstacle rather than a spur to the advancement of knowledge, whether we are considering self-knowledge or knowledge of nature. Bacon is convinced that prior to any taming of nature and matter, there is the taming of the human 'wit' (*ingenium*). As already discussed, mechanical knowledge (i.e. technology) is inherently progressive because it is the gradual adjustment of the human mind to the very motions of matter (not the other way around) without any need to rely on the talent of individual human beings. The advancement of philosophical knowledge, on the other hand, is constantly threatened by the search for originality and brilliance pursued by gifted minds. Mechanical knowledge is self-renewing; philosophical knowledge self-decaying, subject as it is to the 'vermiculate' degenerations of interpretation for interpretation's sake (OFB 4: 28). It is for this reason that Bacon looks with extreme interest at the invention and use of mechanical contrivances for the progress of knowledge. A successful artificial device is a way of producing interpretations of nature that are secure from the aberrations of subjective judgement. In Bacon's theory of knowledge, the mechanical constriction of nature's free motions represents first and foremost a way to foster the concentration of the investigating mind.

Bacon knows very well that, within the sphere of human knowledge, a rift separates mechanical expertise—productive but unaware of its reasons, and thus capable of leading to 'experiments of fruit'—from a disinterested, contemplative attitude towards nature—in possession of the very reasons behind natural phenomena, but unable to concentrate on immediate targets and thus leading to 'experiments of light' (OFB 6: 4). He also knows that the development of technology (*sapientia mechanica*) is marred by the fundamental ambiguity that progress can be both helpful (*ad remedium*) and harmful (*ad nocumentum*). On the one hand, technology advances human civilization by promoting religious worship (*apparatus religionis*), civil society (*decus civilium*), and social progress (*universae vitae cultura*); on the other, it is open to all sorts of political misuses (SEH 6: 659–60, 734–6). Very often it forces nature to produce effects that should not be demanded from it (SEH 6: 661, 736). To bridge the gap between technology (the knowledge of the Sphinx, frustrated and riddled with doubts) and contemplative knowledge (philosophy as disinterested and joyful *contemplatio rerum*, symbolized by Orpheus and the Muses), between the inevitable violence underlying the progress of mechanical expertise and the placid but unproductive recreation of 'georgic' contemplations, Bacon recommends a full engagement with the prose of experience. Cupid (the inherent cupidity of matter), Vulcan (human technology evolving from material cupidity), and Minerva (the light of disinterested knowledge) should coalesce into one coherent plan of action, a plan that moves from the practical and empirical knowledge of nature to a higher understanding of its innermost mechanisms (OFB 11: 212). For Bacon this crucial shift can only happen through experience.

## (p. 57) 2.6 The Prose of Experimental Life

I have already argued in a previous section that Bacon sees induction as a tendency to secure knowledge which is embedded in the very fabric of nature. This crucial point is further demonstrated by the way in which Bacon describes the



transition from the level of mere literacy in experience (*experientia literata*) to that of a controlled interpretation of experience (*interpretatio naturae*) (OFB 11: 158; see Jardine 1990). Significantly, Bacon characterizes *experientia literata* as a form of natural sagacity, or, emblematically speaking, as the ‘Hunt of Pan’ (SEH 4: 413). Sagacious hunting after natural particulars represents the first level of induction. Like a real hunt, knowledge progresses through clues, traces, scents, and keen perceptions. On a higher level, empirical literacy is the stage in the experience of nature at which the human mind enters ‘a more reliable and sound partnership with things (*societas cum rebus*)’ (OFB 6: 2–3). Experience is the only way to establish this partnership.<sup>6</sup>

In Bacon’s philosophy, knowledge begins with individuals. The ‘impressions’ that these individuals make upon the sense organs are ‘the first and most ancient guests of the human mind’ and they form the prime matter of science (*prima materia scientiarum*). As already discussed, Bacon calls this level of knowledge ‘history’ (SEH 1: 494). History is the ‘prime matter’ of philosophy, which means that the natural philosopher cannot avoid getting his hands dirty with material things. History provides the material, the ‘stuff’, the *sylva* and the *suppellex* for proper inductions. Bacon’s use of Ciceronian terms in this context is not accidental. The natural philosopher needs a *topica*, a set of ideas on various subjects through which he or she can organize his or her experience according to general headings (*loci/topoi*). Using these *loci*, the mind abstracts from material ‘individuals’ and elaborates general notions by identifying the natural differences and likenesses that connect things to each other. In *De dignitate et augmentis scientiarum*, Bacon explains that human knowledge starts from a condition of analogical ‘promiscuity’ involving innumerable resemblances between natural things, and from these resemblances proceeds to develop increasingly general and reliable categorizations of similarities (*promiscua rerum naturalium (in plurimis) sub una specie similitudo*) (SEH 1: 494). Promiscuous resemblances represent the raw material from which the mind sorts out and classifies the various species (the ‘forms’) of things. In performing such an activity of division and composition, the mind can either follow its own repository of arbitrary and distorted representations of reality, or trace the real divisions of things and species. The first is the way of the imagination, the second the way of the true knowledge of nature, which, if not based on the actual essence of things (*ipsa rerum evidentia*), at least takes into (p. 58) account the way in which individuals manifest themselves to the cognitive capacity (*captus*) of each investigator (OFB 6: 96–9; SEH 1: 494).

Individuals (*individua*)—portrayed by Bacon as specimens of a class, members of a ‘troop’, or citizens of a ‘nation’—belong to a level of experience that is higher than the one represented by mere ‘singulars’ (*singularia*)—i.e. particulars in a condition of absolute dispersion and unrelatedness, lacking the organizing function of raw but real similarities (*promiscua similitudo*). The existence in nature of objective similarities between things (*similitudo rerum naturalium*) allows the human mind to classify those things according to general classes, thereby escaping the ever-present threat of infinite regress which is the bane of any theory of knowledge based on empirical and experimental particulars. Bacon can thus advance the bold thesis that when the natural philosopher has identified the primary, structural resemblances of matter, he or she can then organize all natural particulars in a coherent fashion: ‘if you know one you know them all’. It is therefore correct to say that natural history deals with species (SEH 1: 494; OFB 6: 100–1). Singulars, individuals, and species represent different levels of organization in nature, levels of organization which the intellect establishes without losing sight of real similarities and without altering the system of subtle relationships that links particulars and universals in one seamless network of natural resemblances. For Bacon, any form of meaningful experience must strike a balance between an infinite amount of material accidents and particulars, on the one hand, and a restricted number of abstractions on the other, between the Scylla of unruly particulars and the Charybdis of empty generalities (SEH 6: 677, 755; OFB 4: 25). Bacon is of the opinion that the senses cannot be the only foundation of knowledge and that experience cannot be left to its own devices. Sense data, by their very nature, require interpretation. Through a controlled exercise of inductive inferences, the *experientia* of disjointed particulars can be elevated to the level of *experientia literata*—and from there can proceed to true *interpretatio naturae*.

It is not only individuals and universals which make up knowledge, but also the speed with which such knowledge is obtained. Time is always of the essence in Bacon’s grand instauration of matter, knowledge, and humankind. A leitmotif in all Bacon’s work is that the progress of knowledge depends on a delicate balance between the hasty and often ill-advised action of human art and the slow pace of empirical experience. All accelerations and anticipations of experience instigated

by the progress of technological knowledge should be tempered by a cautious and sagacious study of the course of nature. Bacon often portrays art as being swifter than nature, suggesting that technological findings can play a key role in speeding up some fundamental processes of nature. Art accomplishes expeditiously what nature performs through circuitous explorations and temporal delays (*per ambages et temporis moras solet*) (SEH 1: 547). Unlike nature, however, art lacks the sense of urgency and inexorability that characterizes the material appetites of nature as they fulfil their undertaken ends (SEH 6: 668, 744). Once again, human knowledge lacks (p. 59) the energy and the focus of material cupidity. The appetite for greater learning which human beings proclaim often masks a deeper appetite for distraction and delusion. In *De sapientia veterum*, Bacon portrays experience as an ass, an image he uses to make clear that any empirical gathering of information is ‘a thing stupid and full of delay, whose slow and tortoise-like pace gave birth to that ancient complaint that *life is short and art is long*’ (SEH 6: 673, 749–50). Art is fast and experience is slow. Yet there is no contradiction here in Bacon’s view of natural philosophy. Both the fable of Atalanta and that of Prometheus (‘Atalanta, or profit’ and ‘Prometheus, or the state of man’) point to the role that distractions—golden apples in Atalanta’s case and thirst in the case of the ass—play in slowing down the process of knowledge and the growth of useful science. For Bacon’s ‘distraction’ is merely another way of describing a lack of method and a tendency to self-delusion (SEH 6: 673, 750; OFB 4: 32).

In Bacon’s emblematic representation of knowledge, the ‘ass’ of experience, in addition to being slow, is also of a low status (*humilis*). By their very nature, particulars are trivial and monotonous. The prose of experience is made up of banal things (*vulgatissimae*), things trifling (*exiles*), frivolous (*leves*), foul (*viles*), ugly (*turpes*), filthy (*sordidae*), and insignificant (*minutae*) (SEH 1: 490, 499; OFB 6: 2–3, 104). The treatise *Sylva Sylvarum* is the epitome of Baconian experience. In it, Bacon considers the principle that ‘nature reveals itself most of all in the *minima*’ as one of his most fundamental axioms (a metaphysical tenet, therefore) (SEH 1: 541). Experience makes the whole of nature a field worth studying. In the characteristically gnomic style of the *Novum organum*, Bacon declares that ‘the Sun enters sewers as much as palaces but still stays clean’. Put in an ontological nutshell, everything that is worthy of being is also worthy of being known, for knowledge is the image of being (*quicquid Essentia dignum est, id etiam Scientia dignum, quae est essentiae imago*) (OFB 11: 180).

Meaningful and refreshing as it may be, however, experience needs to be transcended and transformed into reasons and interpretations. Understanding is more important than results, ‘light’ is more rewarding than ‘fruit’. Further, Bacon has yet another important reason for arguing that knowledge should pass beyond the level of description and collection to reach the condition of interpretation. A life based on experiences and experiments, he states, is a life full of fears and anxieties, a life which demands ‘fortitude and constancy of mind’ (SEH 6: 675, 752). In the *Advancement of Learning*, Bacon warns against spoiling the joy of knowledge with ‘weake feares’ and ‘vast desires’. ‘[A]nxietie of minde’ can transform the ‘dry light’ of the intellect into a light ‘steeped and infused in the humors of the affections’ (OFB 4: 8). Bacon uses the Roman Emperor Antoninus Pius as an example of ‘exceeding tranquillitie, and serenitie’ of mind, for, Bacon goes on, he had such a ‘settled spirite’ that he could ‘enter into the least and most exact differences of causes’ (OFB 4: 41). In order for an experience to be meaningful it requires interpretation, and for interpretation to be reliable it requires a sound (p. 60) mind. The *Novum organum*, then, is first and foremost a medicine of the mind. And the most effective cure for the mind lies in acknowledging its position as a part of the universe, not as the universe’s centre.

## 2.7 Bacon’s Critique of the Anthropocentric View of the Universe

Among the many threats to the progress and reliability of knowledge, Bacon places particular emphasis in the *Advancement of Learning* on the common tendency among human beings—a largely unconscious tendency, it should be added—to prefer self-deception to self-doubt and to produce fabricated realities rather than real knowledge (OFB 4: 25–6). In the *Novum organum*, he treats the same issue metaphorically, describing how each individual has his own ‘cave’ which adulterates and refracts (*frangit et corrumpit*) the light of nature (OFB 11: 80). In the *Essayes*, he puts the matter even more bluntly, condemning the tenacity with which human minds cling to ‘a naturall, though corrupt Love, of the *Lie* it selfe’ (1985: 7). This

‘facilitie of credite’ affects the way in which both ‘matters of fact’ and ‘matters of art and opinion’ become part of history and science, respectively (OFB 4: 26–7). Given that matters of fact and matters of opinion represent the building blocks of human experience, Bacon warns prospective natural philosophers that it is very hard indeed for human beings to leave behind the cave of their private mental universes, thereby achieving a clearer perception of reality. The mind of man is its own theatre, Bacon never tires of repeating, and it is for this reason that philosophy often ends by producing imaginary worlds (*mundi fictitii et scenici*) (OFB 11: 82).

As stated above, Bacon considers the human tendency to impose one’s personal, fanciful vision onto the truth of reality to be the greatest superstition endangering the progress of human knowledge. For him, this valorization of man’s imagination over the actual facts of existence is a sin which surpasses even the original one in magnitude. Adam and Eve, Bacon explains in *Historia naturalis et experimentalis*,

wished to be like God, but their posterity wish to be even greater. For we create worlds, we direct and domineer over nature, we will have it that all things are as in our folly we think they should be, not as seems fittest to Divine wisdom, or as they are found to be in fact; and I know not whether we more distort the facts of nature or our own wits; but we clearly impress the stamp of our own image on the creatures and works of God, instead of carefully examining and recognising in them the stamp of the Creator himself. (SEH 2: 14; 5: 132)

In *De dignitate et augmentis scientiarum*, Bacon goes so far as to suggest a physico-physiological cause of such a distorted and distorting perception of reality. Our (p. 61) spirit—i.e. spirit in a Telesian sense, the principal material constituent of animal life and perception—is even and continuous, and it is on this account that we tend to perceive reality as something equally uniform and homogeneous. ‘Hence the fancy of the mathematicians that the heavenly bodies move in perfect circles, rejecting spiral lines. Hence also it happens, that whereas there are many things in nature unique and full of dissimilarity, yet the cogitation of man still invents for them relatives, parallels, and conjugates’. The human intellect tends to project more order and regularity (*ordo et aequalitas*) onto reality than are actually present in the world (OFB 11: 82). The immediate result of this tendency to project the figments of our imagination onto the realities of nature is that we regard ourselves as the ‘common measure and mirror’ of the universe (SEH 1: 644; OFB 11: 82). In the *Advancement of Learning*, Bacon points out that one of the ‘peccant humors’ affecting the growth of knowledge is the ‘adoration of the minde and vnderstanding of man’. Citing one of his favourite pre-Socratics, Heraclitus, Bacon describes how the philosopher was condemning precisely such ‘Intellectualists’ when he wrote of men who ‘*sought truth in their owne little worlds, and not in the great and common world*’ (OFB 4: 30; 11: 80).

If Bacon has a particular penchant for Heraclitus, he does not show the same appreciation for Protagoras. On the contrary, he firmly rejects the famous fragment in which Protagoras described man as the measure of all things. People ‘falsely claim that human sense is the measure of things’, Bacon writes in *Novum organum*, ‘whereas in fact all perceptions of sense and mind are built to the scale of man (*ex analogia hominis*) and not the universe (*ex analogia Vniuersi*)’ (OFB 11: 78–80). There is a fundamental polarity in Bacon’s theory of knowledge, then, such that the results of any investigation depend on whether the *sylva* of natural likenesses is organized by taking man or the universe as the fundamental point of reference. It may seem surprising that Bacon, the same Bacon whom the historiographic tradition has portrayed as a typical product of Renaissance humanism, and thus thoroughly imbued with values of civic engagement, in fact introduces his programme of universal instauration with a clear profession of anti-humanism. This is yet another instance in which Bacon’s critical attitude towards the characteristic myths of Renaissance humanism becomes glaringly obvious. He rejects the notion that man is the centre of the universe (*copula mundi*), the author of his own fortune (*faber fortunae suae*), endowed with the power of making sense of the external world by simply relying on the internal world of his mind (*ingenium*). In other words, he scorns the image of the philosopher as Socratically uninterested in nature and as engrossed entirely in the study and cultivation of human reason. Man is no measure of the universe; on the contrary, he is measured by the universe. What exists (*essentia*) is worth being known (*scientia*): the ontological primacy of being over knowledge (*scientia* is an *imago* of *essentia*) means that the human mind models its activity on the world, and not the other way around. The ‘temple’ of knowledge which Bacon intends to construct in the human mind (*in intellectu* (p. 62) *humano*) must therefore follow the pattern of the world

(*ad exemplar Mundi*) (OFB 11: 180). The *opus*, the grand project underlying the ‘great instauration’, is to make the human intellect equal to nature, and not to transform nature into a dream of the intellect (OFB 11: 260). To restore the original bond between knowledge and reality, the philosopher must match the order of human experience (*in ordine ad hominem*) with the order of the universe (*in ordine ad universum*).

## 2.8 Words as Distorted Pictures of Reality

One of the greatest difficulties in the philosophical effort to understand reality according to the ‘analogy of the universe’ is the obstacle of language. Words represent things, but more often than not, this representation adulterates experience. The uneven mirror of the human mind distorts (*distorquet*) and stains (*inficit*) the reality of things by mixing and confusing its own nature with the nature of the world’s *essentia* (OFB 11: 80). Words increase the risk of distortion and falsification which constantly accompanies the activity of the mind. Given the pervasive impact that words have on the experience of things, that is, language is both a cause and a symptom of the human tendency to look at the world solely from the narrow perspective of the human mind (*analogia hominis*). Bacon considers words to be the original falsifiers of experience, laden with social prejudices and current opinions (*idola fori*), and, at the same time, blames them for contributing, inadvertently and seamlessly, to the construction of fictional universes. In terms of social experience, words both unite and divide: they form the very fabric of human societies and yet are a constant source of conflicts and controversies. The power of words is almost unavoidable, based as it is on a mixture of unexamined assumptions and fragments of conventional wisdom. People join together through language (*per sermones*), and thus the meaning of words depends on the average understanding of common people (*ex captu vulgi*). The pressures of such linguistic practices—and what is potentially more harmful still, rhetorical transfers and corruptions—damage the intellect’s ability to understand external reality (*verba plane vim faciunt intellectui*). Most of all, men think they have control over language when in fact the opposite is true (OFB 11: 80, 92). When the power of words pollutes the very structure of rational arguments, the world becomes subject to human thoughts and thought is enslaved in turn to words (OFB 11: 108).

Bacon characterizes words as confused labels denoting various actions, which cannot be resolved into stable or universally accepted meanings (*nota confusa diuersarum actionum, quae nullam constantiam aut reductionem patiuntur*) (OFB (p. 63) 11: 94). Definitions can be codified and made coherent, but in the long run, when a definition is brought back to its component words, the human mind is unable to bridge the gap that separates the verbal description of a thing from the material process to which it refers. Names of substances are more reliable than names of qualities, with the exception of the direct perception of the senses (*obiecta sensus immediata*). Words are signs and tokens of notions (*notionum tesserae et signa*), Bacon makes clear, not signs and tokens of things. The notions of the mind function as the ‘soul’ of words and as the foundation of the whole logical structure (*totius huiusmodi structurae ac fabricae basis*). This means that words represent the reality of the mind, not the reality of nature, and that only a thorough examination of the mind can render human beings less naive in their use of words. Our only hope, Bacon concludes, lies in ‘true’ induction, i.e. in guarded abstractions and control of one’s own desires (OFB 11: 30, 68, 94). The elusive nature of human language represents further evidence for Bacon that man’s world of knowledge is constantly exposed to deceptions and delusions of all kinds. Like Pygmalion, men tend to fall narcissistically in love with their linguistic constructions of reality: ‘wordes are but the Images of matter, and except they haue life of reason and inuention: to fall in loue with them, is all one, as to fall in loue with a Picture’ (OFB 4: 23). The best safeguard against the spell cast on human minds by words is a severe philosophical enquiry into the very roots of reality. For Bacon, metaphysics is ‘a true and solid investigation’ into the structures of reality which relies on the laws of nature, and not on those of language (*secundum naturae non sermonis leges*) (SEH 1: 544).<sup>7</sup>

## 2.9 Realism

Despite all the snares of linguistic and mental nature, Bacon is a firm believer in man’s ability to know things as they are

(*ipsa contemplatio rerum prout sunt*) (OFB 11: 196). In other words, he has an optimistic view of human knowledge, which he conceives as an activity that rests on solid ontological foundations and is thus capable of producing reliable descriptions of reality. He acknowledges the usefulness of performing acts of sceptical ‘acatalepsy’, of course, for in his opinion the mind needs to suspend its natural attachments to its own fictions and representations, but he criticizes the true sceptics in their claims that nothing at all can be known of nature (OFB 11: 78). Bacon’s general definition of knowledge as *scientia* hinges fundamentally on the human mind’s ability to represent truth (*veritatis* (p. 64) *imago*). He assumes that an original and natural kinship connects being with knowledge: ‘the truth of being, and the truth of knowing are one, differing no more than the direct beame, and the beame reflected’ (OFB 4: 26; SEH 1: 455: *veritas essendi et veritas cognoscendi idem sunt*). What is more, this ontological equation of understanding and reality finds theological sanction in the *Advancement of Learning*: ‘God hath framed the minde of man as a mirrour, or glasse, capable of the Image of the vniversall world, and ioyfull to receiue the impression thereof’ (OFB 4: 6; see also OFB 6: 7). In *Valerius Terminus*, however, Bacon amends this statement, confining the prerogative of absolute self-transparency to God alone: ‘God is only self-like, having nothing in common with any creature, otherwise than as in shadow and trope’. God alone is pure self-identity. The rest of reality is accessible to man only through reliable analogical representations of things: ‘there is no proceeding in invention of knowledge but by similitude’ (SEH 3: 218). Ontologically speaking, that is, God is the only entity that enjoys a perfect identity of knowledge and being, while humans can only access reality through the representations of their minds. Nevertheless, this asymmetry between divine and human knowledge does not prevent Bacon from claiming that knowledge in all its forms is always knowledge of reality (*res*). Reality, diverse and multilayered though it may be, remains open and accessible to man’s enquiry: ‘nothing parcell of the world, is denied to Mans enquire and inuention’ (OFB 4: 7). The fact that astronomers can devise as many alternative explanations of the universe (*construiones*) as the power of their mind (*ingenium et acer cogitatio*) is not a point in favour of the mathematical disciplines (OFB 6: 112). Mathematical models of reality are necessarily inferior to physical knowledge of things because mathematics feeds on the intellect’s tendency to produce fictive universes of meaning, logically possible but not adjusted to the *res* (SEH 1: 611, 644; OFB 6: 181).

Given that human knowledge has the ontological status of a reflection and refraction, one might rephrase Bacon’s distinction between reality and knowledge as a distinction between history (description of individuals and recurrent patterns) and philosophy (identification of schematisms). Relying on ‘matters of fact’ and ‘matters of art and opinion’, both constantly provided by history, philosophy aims at uncovering the original likenesses of nature which lurk behind the infinite relationships that constitute the fabric of the universe. The most reliable mediation between reality and knowledge, history and philosophy is offered by the process of induction, i.e. the training through which the mind develops the ability to detach itself from egotistic passions, to see itself as part of nature and to identify species and forms in the ‘wood of experience’ (OFB 6: 7). If the human mind ‘worke vpon matter’, it ‘worketh according to the stuffe, and is limited thereby’; but ‘if it worke vpon it selfe, as the Spider worketh his webbe, then it is endlesse, and brings forth indeed Cobwebs of learning, admirable for the finesse of thread and worke, but of no substance or profite’ (OFB 4: 24). The reflective and refractive nature of human knowledge also makes the act of interpretation a key element in Bacon’s theory of (p. 65) knowledge and nature. Bad interpretation of God’s word (‘the Oracle of Gods word’) and bad interpretation of nature (‘the Oracle of Gods work’) come from the same self-referential tendency of the human mind to worship *idola* of its own making, ‘the deceiuing and deformed Images’ produced by ‘the vnequall mirrour’ of the intellect (OFB 4: 25).

Throughout his work, Bacon’s aim is ‘to make the mind of man by help of art a match for the nature of things’ (SEH 4: 412), i.e. to restore the aforementioned partnership with things (*societas cum rebus*). Thus in the *Novum organum*, Bacon’s intellectual enterprise is to equalize human wits (*ingenia*) and, above all, to raise the human faculties of knowledge to the level of fully-fledged faculties of nature. Bacon’s philosophy is a form of thorough and radical naturalism. Nature, he writes in *Descriptio globi intellectualis*, ‘is one and the same (*una atque eadem*), its power effectual in everything, and its trueness to itself unfailing’ (OFB 6: 100–3).

## 2.10 Nature, Religion, and Political Philosophy



Bacon sees the pagan and the Christian worldviews as divided by a fundamental and unbridgeable gap. The heathens, he tells us, considered man to be an image of the world and the world to be an image of God, a belief that causes them to see man (both his body and his soul) as an indirect reflection of his divine creator. Christians, by contrast, have determined that only the human mind is an image of God, while the world cannot properly reflect any of the divine attributes since, as the Bible records, God made the world out of nothing, without following any pre-existing archetypal blueprint. Matter is thus an immediate expression of God's power, pure appetitive energy refractory to the light of divine archetypes, while the visible order of the cosmos hints at the providential regimen of the universe. God's attributes (power and wisdom) represent the 'platforms' of the creation 'as farre as they are reuealed to man'. Power accounts for 'the subsistence of the mater', wisdom for 'the beauty of the fourme'. This means that 'the confused Masse, and matter of heauen and earth' was produced out of nothing 'in a moment', while 'the order and disposition' of that 'Masse' took six days to determine. The creation of matter reveals 'the stile of a Manufacture', the ordering of matter reveals that of 'a lawe, decree, or Councell' (OFB 4: 33). Bacon clearly intends to emphasize the aspects of manual work and of law in the process of creation. Nature is the work of God's hand (*opus manuum*), while the rational character of its activity reveals the presence of divine laws in the very fabric of the natural world. For Bacon, these laws are the aspects of God's nature which human beings can detect through their (p. 66) investigation of the work of the creation. However, no image of God is analogically revealed by nature. The works of a craftsman display his or her power (*potentia*) and skill (*peritia*), but not his or her external appearance (*imago*); so, too, God's works demonstrate the omnipotence and wisdom of the creator (*conditoris omnipotentia et sapientia*), but 'they do not represent in any way His image (*imago*)' (SEH 1: 545). The 'first Creature of God', writes Bacon in his *Essayes*, referring to the six days of the creation, was 'the Light of the Sense', the light that He 'breathed' 'upon the Face of the Matter or Chaos'; the 'Light of Reason', the light that he breathed 'into the Face of Man', was the last work before His Sabbath (which Bacon describes as the 'Illumination' of God's Spirits from the days of the creation) (1985: 8). This means that the creation of the universe started with the introduction of knowledge (the 'Light of the Sense' or *perceptio*) into the very being of matter (its 'Chaos') and ended with the 'breathing' of rational knowledge into the being of man. Perception (the original discerning appetites inherent in matter) and reason (human beings' ability to organize and interpret experience) are the reflections of divine knowledge which are visible in the created universe.

Bacon's positive view of human knowledge is not hampered in any way by the Biblical account of the Fall. Bacon denies that the Fall was caused by man's desire to know nature, for this desire, in his opinion, was thoroughly legitimate. Instead, the end of Adam's condition of bliss and perfection came about due to his determination to act according to moral principles established by his own will ('to giue law vnto himselfe, and to depend no more vpon Gods commaundements') (OFB 4: 6, 34). In addition, Bacon is confident that knowledge of nature is conducive to the strengthening and deepening of religious faith. While a smattering of natural philosophy may indeed incline the human mind to atheism, further delving into the study of secondary causes brings the mind back to God by persuading it of the divinely ordained condition of the universe. Bacon recommends a pious, charitable use of natural knowledge *qua* natural knowledge, and not as a platform to peer into divine mysteries (OFB 4: 9). He condemns excesses of curiosity when they violate the aura of respect which is due to divine mysteries (*secreta divina*). He provides an emblematic representation of this situation through the myth of Pentheus, the Theban king struck with madness for climbing a tree to spy on the Bacchantes while they were performing their rites. Mixing knowledge of nature with the investigation of divine mysteries can only lead to unnecessary mental fluctuations and doubts. Those who 'aspire by the heights of nature and philosophy, as by climbing a tree, to penetrate the divine mysteries' ignore the fundamental difference between the light of nature and the light of the sun, and are condemned by their own curiosity always to vacillate in their judgements (SEH 6: 646, 719–20). The typical results of man's inability to distinguish between knowledge of nature and knowledge of God are such hybrids as heretical religions (*religio haeretica*) and imaginary (p. 67) philosophies (*philosophia commentitia; philosophia phantastica et superstitiosa*) (SEH 1: 546; 6: 675, 753).<sup>8</sup>

The fact that a thorough study of the universe reconfirms the providential regime of the universe, however, does not eliminate the serious philosophical issue of how to explain seemingly reasonable levels of order, organization, and stability in a world that, in the final analysis, is run by self-centred and self-interested appetites. Bacon seems to suggest various solutions. In the fable of 'Coelum', he uses the image of Saturn's castration (symbolizing the limit imposed on matter's relentless

change and perturbation) and the story of the coming of Venus' reign (signifying the emergence of a system of generation based on the tendency to self-preservation) to endorse a view of the universe in which material determinism and eternity of matter are reconciled with an all-encompassing tendency to increasing adaptation and mutual consent (*sympathia*).

Sympathy is a real force in Bacon's cosmos, for it is the natural desire of matter—the source of the most delicate operations of attraction (*exquisita sympathia*)—which holds the world together (SEH 6: 657, 731). Likewise, kinship (*affinitas*) and consent (*conspiratio*) stabilize the tension created by the action of opposite forces (OFB 6: 178). In cases like these, Bacon seems to assume that an increasingly more stable organization of the universe (*magis pacata et durabilis rerum conspiratio*) will be the result of a gradual adjustment to the material conditions of nature (SEH 6: 650, 724).

Nevertheless, how is one to make sense of Bacon's insistence on the internecine war and unrestrained violence (*impotentia*) that affect the particles of matter? As mentioned above, the birth of order out of appetitive chaos is represented through Cupid, who in *De sapientia veterum* symbolizes 'the summary law of nature', i.e. 'the impulse of desire impressed by God upon the primary particles of matter which makes them come together, and which by repetition and multiplication produces all the variety of nature' (SEH 6: 655, 730). Groping about like a blind man, nature manages to produce a precarious but stable frame for things within which 'change proceeds part by part only, the total fabric remaining entire and undisturbed' (Bacon calls this figurative explanation a *sapientissima allegoria*) (SEH 6: 656, 731). However, Bacon agrees with Democritus and Lucretius that this kind of order is constitutively fragile and is always threatened by the possibility that it may be overwhelmed once again by the appetitive drive of matter (SEH 6: 650, 724).

If nature, by means of its own motions, is able to impress precarious forms of order on the fundamentally riotous state of matter, the order based on God's providence is of a much higher level. In *De sapientia veterum*, Bacon refers to God's 'dark and secret' plan (*occulta providentia*) as the 'Night', through which apparent contrasts and local disharmonies become parts of a larger and more (p. 68) complex picture (SEH 6: 662, 738). The original aspect of Bacon's view of providence is that the order of the universe is seen as a form of cunning of reason. Indeed, the view of providence as an astute, prudential wisdom governing the operations of nature in a more or less oblique manner is the hallmark of Bacon's natural philosophy. This particular interpretation should not come as too much of a surprise if we think of the key role that appetites of varying levels of awareness play in Bacon's view of nature. To be sure, one of the most complex and tantalizing points in Bacon's philosophy concerns his effort to connect the level of material desires with that of human desires. At the level of the undifferentiated energy of material cupidity, everything has the same value. Blind desire is beyond good and evil; or better, it is prior to the establishment of laws and rules. In the *Advancement of Learning*, Bacon resorts to the image of the 'Orpheus Theater' to represent the risk (never fully dispelled) that human beings—'full of savage and vnreclaymed desires; of profite, of lust, of reuenge'—may plunge back into 'Anarchie and Confusion' if they stop listening to Orpheus' 'Harpe', i.e. 'precepts', 'laws', 'religion', 'sweetly touched with eloquence and perswasion of Bookes, of Sermons, of haranges', in a word, civilization (OFB 4: 39). As already noted, Bacon characterizes philosophy as an intellectual activity that almost inevitably turns into political and ethical projects, for the plan to implement a material 'instauration' of nature (i.e. the perpetual self-renewal of bodies) is structurally limited by the rudimentary state of human technology (*sapientia mechanica*). The alternative, then, becomes—in a circuitous sort of way—a social and political 'instauration', i.e. the plan to improve the human condition so that it may eventually be compatible with matter and its natural resistances.

But there is another, deeper reason which explains why Bacon's natural philosophy may be described as a project with a deep political bent. Nature's actions are inherently political because nature, always the same in every part of the universe (*una et eadem*), is ruled by desire, and thus requires constant delicate interventions of prudential wisdom to avoid the dangerous material tendency to fall back into an original, chaotic state of blind and self-centred cupidity. Nature—it is worth repeating here—is conquered by obeying it (OFB 6: 8). Thus, Bacon's use of political themes in dealing with the realm of nature is not simply metaphorical, for to a certain extent, these themes are literal descriptions of nature's state. In the 'polity of the world' (*politia mundana*)—this great community (*magna civitas*) of the universe (*universitas rerum*)—bodies relate to each other as 'tribes and families' (SEH 1: 499; OFB 6: 108–9). Bodies of different natures coexist in particular regions of the universe as a result of specific 'covenants' (*foedera*) (OFB 6: 172). One of the fundamental axioms of nature—that 'the power of the acting principle is increased through the antiperistasis of the contrary principle' (that is, through the



reaction roused by an opposing force)—is perfectly applicable in politics, for, Bacon explains, ‘every faction is violently irritated by the encroachment of a contrary faction’ (SEH 4: 339). Indeed, many of the most general axioms of nature can be (p. 69) read in both natural and political terms. The same holds true of Bacon’s emblems. Cupid, for instance, has both a natural philosophical and an ethico-political meaning. He is both the ultimate principle of matter and the origin of social sympathy (SEH 6: 656–7, 731). Likewise, the riddles of the Sphinx are of two kinds, one concerning the nature of things, the other the nature of man. The first leads to dominion over nature, the second to empire over men (SEH 6: 679, 757).<sup>9</sup>

The years immediately following Bacon’s death in 1626 saw a period of contested appropriations of his philosophical legacy which, especially during the Civil Wars (1642–1651), tended to reflect religious and political allegiances. Samuel Hartlib, the Prussian émigré, and Jan Amos Comenius, the Moravian theologian and encyclopaedist, interpreted Bacon’s calls for a renewed view of human learning in terms of pansophical and utopian redefinitions of both culture and society. John Webster, the Paracelsian activist, in his notorious *Academiarum examen* (1653), brought to the fore the most radical implications underlying Bacon’s ‘great instauration’, advocating the transformation of university curricula along the lines of a reformed version of natural magic, as Bacon had announced in the posthumous *Sylva Sylvarum*. In their *Vindiciae academiarum* (1654), Seth Ward and John Wilkins replied to Webster’s claims and defended an experimental and methodological interpretation of Bacon’s philosophy, purged of all speculative assumptions, an interpretation followed by Robert Boyle and the virtuosi gathered around the Royal Society (established in 1660). The view of Bacon as the herald of a new, anti-dogmatic way of studying nature, which is epitomized in Thomas Sprat’s influential *History of the Royal-Society* (1667), had already been endorsed by René Descartes. In his correspondence with Marin Mersenne, Descartes had acknowledged the importance of extending the scope of human learning through a comprehensive collection and direct examination of natural phenomena. On the other hand, Bacon’s more ontologically connoted notions of vital materialism and appetitive perception remained out of the received picture of Baconian naturalism. Through the mediation of Francis Glisson, who both in his medical (*Anatomia hepatis*, 1654, *De ventriculo*, 1677) and philosophical works (*De natura substantiae energetica*, 1672) was amongst the very few to accept Bacon’s view of material appetites as a foundation for a new philosophy, Bacon’s theories of living matter, vital spirits, and original motions of nature silently migrated from the domain of philosophy to that of medicine and physiology, leaving very few traces of the original Baconian framework. When the eighteenth-century natural philosophers investigating the elusive nature of irritability dropped Glisson’s name from the list of the precursors, they cared even less to retrace the original Baconian meaning of responsive and appetitive matter.

(p. 70) Given the presence of so many forms of creative uptake of Baconian ideas during the seventeenth century, one cannot dismiss any of the different strands of Baconianism as irrelevant or ‘vulgar’. Experimental, metaphysical, social, and utopian Baconianisms were not only historically legitimate forms of Baconian exegesis; they also underwent a series of original and sometimes controversial crossovers.

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## Notes:

(1) On Bacon's philosophical use of fables, myths, and emblems, see Lemmi 1933, Rossi 1968: 73–134.

(2) For general overviews of Bacon's philosophy see Rossi 1968, Pérez-Ramos 1988, Briggs 1989, Rees 1996, Zagorin 1998, Gaukroger 2001, Fattori 2005, and Giglioni 2011.

(3) On Bacon's views on atomism see Kargon 1966, Gemelli 1996, Manzo 2001 and 2003.

(4) On Bacon's notion of method, induction, and communication see Vickers 1968, Jardine 1974 and 1990, Stephens 1975, Milton 1987, Pérez-Ramos 1988, Malherbe 1996, Vickers 2000, and Giglioni 2012.

(5) On the question of the relationship between art and nature in Bacon see Pérez-Ramos 1988, Newman 2004: 256–71, and Weeks 2007, 2008.

- (6) On Bacon's notion of experimental knowledge see Gaukroger 2001, Hunter 2007, and Anstey 2012.
- (7) On Bacon's view of language see Vickers 1996 and Lewis 2007.
- (8) On Bacon's theological views see McKnight 2006, Harrison 2007, and Matthews 2008.
- (9) On the links between Bacon's political and natural philosophical projects see Martin 1992.

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## Robert Boyle

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## Abstract and Keywords

This chapter examines the philosophical views of English philosopher Robert Boyle, outlining his life and character, and describing his views on religion, the natural world, and natural laws. It highlights his lifelong interest in ethics, his uncompromising insistence on the priority of experiment over theory, and his influence on the works of Isaac Newton. The chapter also discusses Boyle's awareness of human frailty in himself and others, and of the weakness of human nature.

Keywords: Robert Boyle, English philosopher, religion, natural world, natural laws, ethics, experiment over theory, human nature

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I have met with abundance of Quotations wherein the Transcriber doth so mistake, or so mis-represent the cited Authors Meaning, sometimes out of Inadvertence, but sometimes too I fear out of Indulgence to his own Hypothesis, that if ever I should be tempted to trouble the World with any of my thoughts, I would beseech my Readers, not to look upon anything as my Opinion or Assertion that is not deliver'd in the entire Series of my own Words.<sup>1</sup>

BOYLE'S desire, that writers should offer his thoughts in the 'entire Series' of his own words, is understandable but, in general, unachievable.<sup>2</sup> Boyle was aware of his 'proximity that I feare is already too great' (*Usefulness 2*, B 6: 402), and though he is, often, a delight to read, a brief account of his views, such as this, must rely, instead of extended quotations, on references to his published works and manuscripts, and to a variety of secondary sources.<sup>3</sup>

In this outline of Boyle's philosophical views I shall, after a brief look at his life and character, concentrate on his religious views, his views about the natural world, (p. 74) including his views on natural laws, and on qualities, and conclude with a brief look at his lifelong interest in ethics.

## 3.1 Life and Character<sup>4</sup>

Robert Boyle (1627–1691) was his parents' fourteenth, penultimate, child, and the last to survive to adulthood. His mother died when he was three, and his older sister Katherine (1615–1691) seems to have taken over the maternal role. When Boyle returned, effectively penniless,<sup>5</sup> from the continent at the age of seventeen, he turned immediately to Katherine, and subsequently spent most of his adult life with her. When she died, in 1691, Boyle died the following week. Katherine was as pious as she was clever, and his father was, not unusually for the time, a stereotype of sanctimony. Unsurprisingly, the mature Boyle's philosophical views were strongly interconnected with his religious views, though he was not immune to

religious doubts, which he ‘ever look’t upon ... as Temptations to be suppress’t then Doubts to be satisfy’d’. Such doubts ‘were such a Disease to his Faith as the Tooth-ach is to the Body; for tho it be not mortall, ’tis very troublesome’.<sup>6</sup>

For Boyle an examined faith was the only acceptable one. Noting that ‘the greatest number of those that pass for Christians, profess themselves such upon the same grounds that would have made them Mahometans, if they had been born and bred in Turkey’ (BOA §3.7.5: 302),<sup>7</sup> he held that more was required of the thinking believer.

In scientific matters as in religion Boyle was cautious:<sup>8</sup>

Perhaps you will wonder ... that in almost every one of the following Essays I should speak so doubtingly, and use so often, *Perhaps, It seems, ’Tis not improbable*, and such other expressions as argue a diffidence of the truth of the Opinions I incline to ... But ... I dare speak confidently and positively of very few things, except of Matters of fact. And when I venture to deliver any thing by way of Opinion, I should, if it were not for meer shame, speak yet more diffidently than I have been wont to do. (*Certain Physiological Essays*, B 2: 19)

As a young man Boyle ‘saw his mission in life ... as a purveyor of piety and ethical rectitude’ (Hunter 2000a: 18), a mission which never entirely vanished. It was, (p. 75) however, forced into second place when he turned to natural, i.e. experimental, philosophy:

Vulcan has so transported and bewitch’d mee, that as the Delights I tast in it, make me fancy my Laboratory a kind of Elizium; ... I there forget my Standish and my Bookes and almost all things, but the unchangeable Resolution I have made of continuing till Death. (Boyle to his sister Katherine, Lady Ranelagh, 31 August 1649; Boyle 2001, 1: 83)<sup>9</sup>

At this period Boyle moved from Stalbridge to Oxford where he met, among others, Robert Hooke, one of the great experimenters of the seventeenth, and indeed of any, century. Almost immediately, Hooke made, at Boyle’s request, the air pump which Boyle was to use to such advantage. It was in Oxford that Boyle’s great outpouring of scientific works began, but it is worth noting that from his early works such as *Spring of the Air* (1660), *Certain Physiological Essays*, and *The Sceptical Chymist* (both 1661), through to the publication in the last year of his life of the *Christian Virtuoso*, whose subtitle reminds us ‘That by being addicted to *Experimental Philosophy*, a Man is rather Assisted, than Indisposed, to be a *Good Christian*’, his interest in theology remained, and, equally, in the early *Style of the Scriptures* (1661), as in the later *Excellency ... of the Mechanical Hypothesis* (1674), Boyle emphasized the value to faith of experimental philosophy.

## 3.2 Religion

Although, like many seventeenth-century thinkers, Boyle spent considerable time and energy in the attempt to combat atheism, he seems, again in common with others, to have believed that it was hard for a thinking person to *be* an atheist (see further Berman 1988). That there was a god of *some* sort he took, on a variety of design argument grounds, to be fairly obvious,<sup>10</sup> but among his offered proofs, three stand out: the argument from the existence of rational souls, from the implausibility of materialism, and from miracles.

Briefly, for the first two: Boyle considered the possibility that mere unassisted matter could rise to the heights of intellection and, like others at the time, found the claim totally implausible (see MacIntosh 1997). But if we have an incorporeal soul—which we know by revelation (*Excellency of Theology*, B 8: 22) as well as by reasoning—its interaction with a material body lies outside the scope of natural (p. 76) philosophy (*Christian Virtuoso* 2, B 12: 475). The natural philosopher treats ‘the World but as the great System of things Corporeal, as it once really was, towards the close of the sixth day of the Creation, when God had finish’d all his material Works, but had not yet Created *Man*’ (*Notion of Nature*, B 10: 452).<sup>11</sup> Boyle was aware of the many difficulties the Cartesian account faces (see, e.g. *Excellency of Theology*, B 8: 68), but he could see no acceptable alternative. To explain mind/body interaction required something beyond nature, and Boyle was



happy to allot the task to God.

Secondly, Boyle, assuming that the main explanatory possibility, apart from God, was materialism, offered two main reasons why materialism is unsatisfactory:

(i) Plausibility: understanding the world requires the notion of laws. Somehow, nomological regularities were instituted and, somehow, are maintained. ‘Law’, in ‘law of nature’, carries misleading overtones: laws may be obeyed or disobeyed, but non-rational entities can do neither. Natural laws are simply regularities, and noting a regularity does not explain it. Materialism’s *chance* is a most improbable mechanism for the order we see around us. Indeed, ‘Chance’, said Boyle, ‘is really no natural Cause or Agent, but a Creature of Man’s Intellect’ (*Final Causes*, B 11: 105). Even more to the point is the fact that materialism is quite unable to explain the existence of animals, let alone their ability to breed true.<sup>12</sup> The Stoics, and, less ‘pardonably ... their follower herein, Mr *Hobbs* ... would have Men to spring up like Mushrooms out of the ground’ (*Excellency of Theology*, B 8: 22), but this is not a notion to be taken seriously.<sup>13</sup>

(ii) Parsimony: If we consider the doctrine of an eternal atomistic universe we find that its atoms require just those qualities which puzzle people in a deity. The classical atomist’s atoms possess a number of (necessarily) inexplicable qualities (BOA §4.1: 339), such as each atom’s *determinate* bulk or size, and its *particular* figure. It is analytic that each atom have *some* size, but contingent and unexplained that it has just the size it does. The materialist, denying that there is a god, must accept things that ‘confound his understanding; since the most abstruse and perplexing Attributes, such as self-existence, Eternity, self-motion, &c. must necessarily belong either to God or to matter; and if he will not ascribe them to the Deity, he must doe it to the despicablest Atome’ (BOA §4.1: 341).

(p. 77) Having established *independently* that there *is* a God, it is, Boyle argues, reasonable to suppose that God will have revealed such truths about himself as he wishes us to know. Thus we should look to an *instituted* religion for the truth about God. But *which?*—That is the function of miracles: they let us discover which instituted religion is the correct one. Of course, until we are ‘duely satisfied that the Miracles themselves are Divine and not Diabolical, I must in reason refrain from acknowledging them. ... But if the Revelation backd by a Miracle proposes nothing [contradictory] I then thinke my selfe oblig’d to admit both the Miracle, and the Religion it attests.’<sup>14</sup>

What religion *does* it attest? When Boyle considered the miracles on offer, he found that the acceptable ones were precisely those which grounded the faith in which he had been brought up: Christianity’s miracles are superior to those of other faiths, and so the Christian revelation is the one we should accept.

### 3.2.1 The Argument from Miracles<sup>15</sup>

Although that is in general Boyle’s position, on one occasion he argues that a correct account of miracles will yield not merely the correctness of Christianity, but the acceptability of religious belief as such. His argument is modal, and has a straightforward structure:

- 1) Show that God’s *non*-existence cannot be proved, thereby, he argues (not quite fallaciously as we shall see), leaving open the possibility of God’s existence.
- 2) Given the *possibility* of God’s existence, the reported miracles are *possible* (BOA §3.8.1: 305).
- 3) There are three major objections to Christianity’s miracles:
  - (a) They are insufficiently testified. But, Boyle argues, the evidence is as good for the reputed miracles as for any other historical occurrence.<sup>16</sup>
  - (b) The reported miracles are impossible. Yes, says Boyle, *physically* impossible, but not—he emphasizes—*logically* impossible; they are within *God*’s power, though not ours. This leads directly to the third major objection:
  - (c) Miracles require a God: and it is impossible that God exists. This objection, Boyle points out, allows that the accounts of miracles will (subject to the acceptability of their testimony) be acceptable, *if* this objection fails. So

a stand off here is all the Christian needs.

(p. 78)

Since Boyle's objector has in effect granted that *if* God exists, miracles are possible, it follows that if it is *possible* that God exists then miracles are possible, and if the reported miracles occurred, then Christianity is well grounded, and we may conclude that God exists. However, Boyle's claim that God's *possibility* follows from an inability to demonstrate God's *impossibility* clearly needs shoring up since formally similar claims are, in general, simply false. Boyle, though not explicitly noticing this point, has, nonetheless, an interesting response.

Claiming that God's existence is impossible amounts, Boyle suggests, to the claim that the properties ascribed to God are incompatible. To that suggestion Boyle has three lines of defence, the final one of which may save his initial premise from its initial implausibility (BOA §3.8.3: 310–12). First, we should ask whether this purported incompatibility can really be *demonstrated*?<sup>17</sup> No, says Boyle, it cannot, for to show that something is impossible we must show either that its purported properties are directly incompatible—a circular square, for example—or that its claimed properties allow us to deduce a contradiction, an odd integer as the sum of two equal integer parts, for example (BOA §3.8.3: 310–11). But, says Boyle, somewhat startlingly, the deity is 'a *Being Infinitely perfect*; or, to express the same notion a little more clearly, that 'tis a *Being as perfect as we are able to conceive*'.<sup>18</sup> Thus, any attempted demonstration of the incompatibility of God's properties is unlikely to succeed (see further BOA: 212–13).

But what if, despite the supposed unlikelihood, the properties ascribed to God are demonstrably incompatible? Boyle has two responses. '[W]e may say That they ought not to be ascrib'd to God, thô hitherto they have been soe, by persons that it seems did not consider the matter with sufficient attention & skill' (BOA §3.8.3: 311).

But, once again, what if the properties in question are really incompatible though plausibly ascribed? Boyle's answer is surprising but in character: we must simply reduce the number of qualities ascribed to God until there is no incompatibility: '[T]hō men shall forbear to ascribe to God any thing that it manifestly appears cannot belong to him, there will remain included in his *Idea*, excellencies enough to make him the subject of our highest wonder & adoration' (BOA §3.8.3: 311). Boyle offers no suggestions about which of any given pair of incompatible (p. 79) properties should be dropped, though presumably God's ability to act, miraculously, counter to God's own 'ordinary and general concourse' must remain.<sup>19</sup>

Thus, we now include in the notion of God only those predicates which appear compatible. God now is simply the, or perhaps a, being such that *we* cannot conceive a greater. Any supposed demonstration of imperfection, for example by showing that the members of some subset of God's believed properties are incompatible, simply allows us to characterize God more fully: God is the being which *has* perfection P<sub>1</sub> but, necessarily now, *lacks* perfection P<sub>2</sub>. Thus God's possibility is achieved by fiat, though of course the being thus characterized may be very remote from orthodox theological accounts.

So it is possible that a being exists who is 'as perfect as 'tis possible a Being can be, when all things are duely compar'd & consider'd' (BOA §3.8.3: 312). Perhaps the most important assumption now is the claim that we have sufficient historical testimony to make it rational to accept the gospel accounts of the miracles of Christ. Hume in the next century was dubious, Boyle in the seventeenth was not, and we in the twenty-first may decide as we will about the testimony premise, and about the acceptability of Boyle's diminished deity.

### 3.3 Boyle's Worldview

Boyle had a straightforward notion of creation. God, at a particular, fairly recent, point in absolute time, made matter. Boyle saw 'no just reason to embrace their Opinion, that would so turn the two first Chapters of *Genesis* into an Allegory, as to overthrow the Literal and Historical sense of them' (*Excellency of Theology*, B 8: 21).

Concerning God's creation, revelation gives us (1) truths of which we would otherwise be ignorant, such as 'the order and

time of the Creation of the World and of the first man and woman'; (2) details of truths which we can otherwise obtain 'but very dimly, incogently, and defectively'

such as ... That the World had a Beginning, that 'tis upheld and govern'd by Gods general Concourse & Providence; that God ... foresees those future things, we call *contingent*; that mens souls shall not dy with their Bodys, & many other [truths].

(p. 80) Additionally there are (3) '*hints*' which lead us to truths we would otherwise miss, such as 'that whatever men have generally believed, Vegetables had their Origine independent from the Sun, the Earth haveing produc'd all kinds of Plants a day before God made that Luminary' (BP 7: 242–3, B 14: 269, 271).

God, Boyle believes, could have started things off earlier or later, but chose not to. Having created matter, he broke it up and started it moving. Sometimes Boyle says he broke it up *by* starting it moving.<sup>20</sup> *Then* he gave it laws, since the 'casual justlings of atoms' would not have given rise to this world.<sup>21</sup> Hooke, explicating Genesis, argued for the same ordering (Hooke 1705: 174–5). For Boyle and Hooke a world without laws is not only possible, our world was such a world for a time.

Boyle's position is an intermediate one between the claim that some objects or events are lawless, and the Leibnizian claim that lawlessness is impossible.<sup>22</sup> For Boyle, physical objects exhibit nomological regularities, but this is a contingent fact about the world, or rather, for Boyle was cautious about generalizing, about the spatio-temporal portion of it we occupy.<sup>23</sup> Additionally, there are laws that are *not* laws of nature, with the laws of the interconnection between body and soul providing an obvious example: 'the very conditions of the *Union* of the Soul and Body; which being settled at first by God's *arbitrary institution*, and having nothing in all Nature parallel to them, the manner and Terms of that strange Union, is a Riddle to Philosophers, but must needs be clearly known to *Him*, that alone did Institute it, and, (all the while it lasts) does preserve it'.<sup>24</sup>

All this holds for the corporeal universe, as opposed to the three sorts of incorporeal creatures God created or, in our case, continues to create: angels, demons, and human souls: the good, the bad, and the imprisoned.<sup>25</sup> The angels were created 'before the visible World ... was half compleated', but God creates new human souls daily, and moreover works a 'physical miracle' to attach them to their respective bodies.<sup>26</sup> Sometimes Boyle felt that although humans are made in God's (p. 81) image they, like other created beings, 'at their best are but Umbratile and Arbitrary Pictures of God their Creatour' (BOA §2.2.37: 145), but in a variety of other places he offers a more traditional account of the soul as the image of God (e.g. *Christian Virtuoso* 2, B 12: 504).

Although humans are made in the image of God, they are considerably less clever than the angels,<sup>27</sup> and since it is quite possible that God's primary end in making the universe was to provide a universe for the angels, and not centrally for humans, it is thereby quite possible that the universe will be too complicated for us to understand.<sup>28</sup>

### 3.3.1 Matter and the Material World

Regarding matter, Boyle agreed 'with the generality of Philosophers ... that there is one ... Universal Matter common to all Bodies, by which I mean a Substance extended, divisible and impenetrable' (*Forms and Qualities*, B 5: 305). Matter is one and the same whether sub- or supra-lunary, whether at the micro level or in the farthest reaches of the cosmos.<sup>29</sup> But is it universal and space-filling (whether 'subtle' or 'gross'), or is it universal and gappily atomistic? On this topic Boyle always reserved his opinion (see further MacIntosh 1991). Nonetheless, it is to (shaped or textured) matter and motion that we should look for all our naturalistic explanations, though a number of other subsidiary factors may come into play *en route* to such explanations.

Although matter is both one and universal, Boyle considered it to be at least a logical possibility that matter in other parts of the universe might have a different nature, and he certainly thought it possible that other parts of the world (or other worlds)

might have (have had) the same matter obeying different laws. That allows four possibilities,<sup>30</sup> three of which may, for all we know, be realized in the universe in which we live, though Boyle in fact believed the first to be the true account:

- 1) The world is composed wholly of the matter of which we have knowledge, obeying the laws (mostly unknown to us) which God has instituted in our world. Call this *our* matter, and the laws it obeys, *our* laws.
- 2) A world might be composed wholly or in part, and our world may be partially so composed, of *other* matter, obeying *our* laws (*Hidden Qualities*, B 8: 122).
- (p. 82) 3) A world could be composed wholly or in part, and our world might be partially composed, of *our* matter, obeying *other* laws.
- 4) God might have created a world composed wholly of *other* matter, obeying *other* laws.<sup>31</sup>

### 3.3.2 What are Laws of Nature?

On a number of occasions Boyle assures us that ‘God [is] the Author of the Universe, and the free Establisher of the Laws of motion, whose general Concourse is necessary to the Conservation and Efficacy of every particular Physical Agent’ (B 8: 251). The trouble is, he seems to have thought that this remark was fairly transparent, and does not trouble to explain it further.

It is tempting to suppose that Boyle must have had some reasonably well thought out views on the question of *how* God sustains the world. He was after all one of the most impatient of thinkers when it came to fake or non-explanations, and he was in general very aware of the danger of letting verbal ‘explanations’ get in the way of real ones (see *Forms and Qualities*, B 5: 351–2 and 5: 453–5).

On the other hand, he had a well worked out doctrine concerning the limitations of reason, and often points out that we should not expect fully to understand God’s workings, for God is, after all, ‘a Being of a most Primary, and most Singular Nature’ (BOA §4.1: 357; see also Wojcik 1997). Furthermore, he was willing to admit the impossibility of our understanding—at least given the present limitations on our intellects—even quite ordinary and law-like matters, such as the way in which the human soul and human body interact. How God could have created the world, and how it is that he can intervene in it, are matters as mysterious to us as how mind and body can interact, and that is a total mystery.

Sometimes, Boyle remarks, our ignorance of things has to do simply with our lack of knowledge of the inner or hidden workings of a thing. He offers his, and indeed the century’s, standard example of clocks which may have various internal mechanisms to produce the same outer effects. Thus he remarks that ‘we know in generall that Digestion is made by some ... subtil substance in the stomach; tho we know not the particular Nature of [it]’. Sometimes, though, our ignorance is of a deeper, richer variety:

*sometimes ... we are not able to conceive the modus of a thing, so much as ... to the possibility of it ... as when we cannot conceive how the rational soul can ... determine the motions of the Body. And in this latter case our not knowing the modus of a thing is usually more then a bare Ignorance, [because] it seems repugnant to the Nature of things, that an Immaterial substance not being impenetrable can resist or reflect the motion of a Body &c. (BOA §3.5.19: 255)*

(p. 83) Boyle was impatient with the Cartesian suggestion that we might be able to alter the direction though not the quantity of motion, because he saw clearly that interfering with the directed velocity required as mysterious an interaction as altering the ‘quantity of motion’ would: ‘I do as little conceive how the motions of the *Conarion* can work upon an Immaterial soul, as how any other part of the Body can do it. Nor do I conceive how an Immaterial Soul can work upon the *Conarion* its self, more then it can upon any other part of the Body’ (BOA §3.5.15: 253). It will not ‘suffice to object, that the human will does, in these cases, not produce any new motion, but only determine the motions of the [animal] spirits. ... For to put a check ... to the motion of a body ... without opposing to the moving body, some other body ... is not a mechanical operation’ (*Christian Virtuoso* 2, B 12: 480). A change of direction, just as much as a change in the ‘quantity of motion’, is

as mysterious and inexplicable, if done by incorporeal means, as the introduction of energy into the system would be.

Laws of nature, whatever they may be, are *not* explicable in terms of the nature of the bodies to which they apply. For, first, 'Motion, as well as Rest, being accidentall to matter ... must be ascrib'd to some external Cause', and second, 'what ever be the *cause* of motion, the *Laws* of the Communication of motion, cannot reasonably be supposed to proceed from the particular nature or any compact of the body's Corpuscles themselves; but, to be certaine and regular, must have been instituted by an Intelligent and powerfull Being' (BOA §3.4.32: 243; §3.4.33: 243–4).

As clerics every Sunday were keen to point out, the whole creation reveals the hand of God,<sup>32</sup> and Boyle was clear that God sustains both creatures and laws: 'In reference to the whole Universe, and the Creatures it comprises, God may be in some measure resembled by the Magnet, that sustains and pervades, and governs or gives their due dispositions, to the pieces of Steel it's Influence reaches to' (BOA §2.2.53: 158).

That God was required constantly to sustain the laws of his universe was generally accepted at the time, but it gave rise to the standard danger of slipping into occasionalism, and it is by no means clear that Boyle avoided this danger (see Anstey 1999, 2000).

In summary, then, God is involved with the laws of nature in three ways. First, *after* having created matter and set it in motion, he instituted the laws governing motion. Secondly, he intervened *immediately after* creation to instil some *extra* principles and give some extra guidance to the corpuscles. Thirdly, he continues to ensure that things keep, more or less, to the laws he has decided upon. God can and does continue to intervene in his creation, but he does not, save miraculously, intervene in the strictly material interactions of that creation.

(p. 84) However, though Boyle believes *that* there are laws of nature, he nowhere hazards a guess as to *what* they might be. He remarks, for example, 'If two bodies be once at rest against one another, it seems consonant to the Catholick Laws of Nature, that they should continue in that state of rest, till some force capable to over-power their resistance puts them out of it' (*Firmness*, B 2: 152). He does not say that this inertial principle *is* a law of nature, merely that it is consonant with such laws. He remarks of Descartes' purported laws that he finds them dubious (*High Veneration*, B 10: 174–5), but does not offer any alternative. His friend and early co-experimenter Hooke says light and gravity are the two main laws of motion, but does not, apart from the suggestion that light is transmitted instantaneously, offer any quantitative account of them (Hooke 1705: 175). So I doubt, really, whether Boyle felt himself to know *any* laws of nature, nor is it clear that he was looking for any, at least of the catholic ones (see also *Cosmical Suspensions*, B 6: 305).

In the experiments that led to what we now call Boyle's Law, Boyle was interested in showing that common atmospheric air had a 'spring'. In that series of experiments he took himself to have shown that, for atmospheric air, within the limits of his experimental set-up, 'the pressures and expansions [are] in reciprocal proportion'. He does not take himself to have shown anything more than this. He does remark that further experiments may show that the relationship holds outside the boundary conditions imposed by the experimental set-up, but he points out that the experiments he has just made do not show that: 'till further tryal hath more clearly informed me, I shall not venture to determine whether or no the intimated Theory will hold universally and precisely, either in Condensation of Air, or Rarefaction' (*Defence* 2.5, B 3: 59, 60).

All this is clearly in accord with Boyle's cautious scientific outlook. From his point of view, a priori speculation was unlikely to be useful, and global theories were to be advanced, if at all, but tentatively. As far as the deep structure of the world goes, we should be content with plausible hypotheses, so long merely as they are intelligible, i.e. mechanical. What was of interest, and what went beyond mere plausibility, was the everyday business of finding results that could be turned to practical purpose: producing what certainly *appeared* to be a vacuum, and finding that it could preserve food, for example (*Spring and Weight of the Air*, II, B 9: 255). What was of almost no interest to Boyle was system building;<sup>33</sup> what was of considerable interest was fact finding.

As Anstey and Hunter have pointed out (Anstey and Hunter 2008, and cf. Hunter 2007) Boyle was an even more

thoroughgoing Baconian than has hitherto been accepted. He was interested first and foremost in providing ‘histories’ which collected factual observations in particular scientific areas; he was interested in providing, following Bacon’s method of enabling ‘considering men [to] make (p. 85) Discoveries’, those results which are ‘considerably useful to Mankind’ (*Usefulness* 2, B 6: 432).

### 3.3.3 Qualities

The theory of material qualities is treated at length in this *Handbook* by Peter Anstey, and Boyle’s views in particular are discussed in depth by him in Anstey (2000). Boyle, Anstey points out (Anstey 2000: 29), distinguished mechanical from non-mechanical qualities, and among the non-mechanical ones, further distinguished qualities as manifest,<sup>34</sup> occult (such as magnetism and (static) electricity), and sensible. And, Anstey notes, although ‘Boyle is insistent about what he did *not* believe about the sensible qualities’, he himself ‘had no systematic doctrine of the sensible qualities’. It is also worth noting that Boyle had a more circumscribed notion of *quality* than we currently do. Boyle remarks that

the word *Quality* ... is us’d in such various senses, as to make it ambiguous enough ... I think it not amisse to intimate in this place, that there are some things that have been look’t upon as Qualities, which ought rather to be look’d upon as states of Matter, or Complexions of particular Qualities, as *animal*, *inanimal*, &c ... And there are some other Attributes, namely *Size*, *Shape*, *Motion*, and *Rest*, that are wont to be reckon’d among Qualities, which may more conveniently be esteemed the *Primary Modes* of the parts of Matter; since from these simple Attributes, or Primordially Affections, all the Qualities are deriv’d. But this consideration relating to Words and Names, I shall not insist upon it. (*Cosmical Qualities*, B 6: 267)

Boyle pointed out that the question of whether bodies had sensible qualities was, in view of the dispositional character of such qualities, to some extent a terminological issue:

I do not deny, but that Bodies may be said, in a very favourable sense, to have those Qualities we call Sensible, though there were no Animals in the World: for a Body in that case may differ from those Bodies, which now are quite devoid of Quality, in its having such a disposition of its Constituent Coruscules, that in case it were duely apply’d to the Sensory of an Animal, it would produce such a sensible Quality, which a Body of another Texture would not ... [I]f there were no Sensitive Beings, those Bodies that are now the Objects of our Senses, would be but *dispositively*, if I may so speak, endow’d with Colours, Tasts, and the like; and *actually* but onely with those more Catholick Affections of Bodies, Figure, Motion, Texture, &c. (*Forms and Qualities*, B 5: 318–19)

Boyle was clear-sighted about qualities, and by no means tied himself down to the notion that there was a single important distinction to be made among qualities. As Anstey points out, Boyle notes a number of distinct distinctions among qualities. (p. 86) In addition to the distinction between the ‘Catholick Affections of Matter’ (*Cosmical Qualities*, B 6: 274) and all others, including the dispositional ones, Boyle highlights the distinction between sensible and philosophical qualities (the heat we feel and the heat we measure, etc. (*Cold*, B 7: 344–5)), between relational and non-relational qualities (including *texture* (*Forms and Qualities*, B 5: 315–16)), and between manifest and occult qualities. For Boyle the other qualities depend upon the mechanical ones of shape, size, and motion (and their associated quality of texture), but we might note that this grouping does not overlap with other standard (primary/secondary) distinctions of the period (for details see Anstey 2000: 28–30).

## 3.4 Ethics

### 3.4.1 Early Views

‘My Ethicks go very slowly on’ (Boyle 2001 1: 34) Boyle wrote to Katherine in the spring of 1646. This work Boyle is referring to, *The Aretology*, occurs in two versions, a longer version, transcribed in Boyle 1991, and a shorter, distinct, version at MS 195: 1–32r. In *The Aretology* Boyle argues:



- (a) that the notion of ‘good for’ is parasitic on the notion of ‘good’. No ‘goods for’ without stand-alone ‘goods’;
- (b) that virtues and vices are dispositions (‘habitudes’) and are therefore to some extent within our control; they are, in Boyle’s terminology, ‘elective’;
- (c) that the goal of virtuous behaviour is the attaining of happiness, which for Boyle means happiness as a Christian.

There is a pair of background assumptions worth noting explicitly:

- (i) Boyle assumes without question the truth of the Christian religion with an associated doctrine of Heaven and Hell. These, though, are not used in the traditional way to ground a carrot-and-stick morality. Rather, and interestingly, their function is to show the inutility of certain goods (misers must lose their riches; honour is needless in heaven, useless in Hell, and so on).
- (ii) It is simply assumed that we can know that certain things (e.g. wealth, fame) are *not* the desired ‘Felicity’ by pointing out that good and bad alike can attain them. This generates a problem, though not one which Boyle noticed, for it means that the good/bad people distinction is logically prior to the felicitous/infelicitous distinction, even though ‘Felicity’ is our ultimate end. So although what constitutes being a good person is being virtuous, and being virtuous (p. 87) involves seeking (the right sort of) felicity, what counts as *felicity* is tested against the prior knowledge of good and bad persons.

### 3.4.2 Christian Morality

Scattered throughout Boyle’s manuscripts are a number of short pieces dealing with specifically *Christian* morality. The *Christian* virtuoso is the person who can most appreciate the wonders of the world, and hence the wonders that God has created, and hence the wonder of God. Boyle says so often and explicitly.<sup>35</sup> In addition, the Christian is in a better position morally than others, including the various intelligent and moral predecessors of Christ.

Why *Christian* morality? Because the Christian religion can be seen to be true, and that will be an incentive to morality, since the afterlife will then be seen to be more important than our present life (BOA §3.3.2: 224–5). Boyle picks out a number of advantages of specifically *Christian* morality:

1. It has greater punishments available to back up its edicts than pagan morality has.
2. It recognizes the importance of those attributes which are ‘constituent parts’ of the person, such as piety and virtue (BP 5: 38, also BOA §3.3.16: 232).
3. It allows conscience to take its rightful place: ‘Religion to the Conscience of vicious Persons it would convert, is like Light to the Eye of those that come out of a Dark Prison: it troubles them at first ... but afterwards makes them an advantageous amends, by the Discoverys and the other benefits it affords them’ (BOA §3.3.4: 225). Moreover, the reward that a properly functioning conscience bestows is merely a signal of greater appreciation to come:

Those internal applauses of vertue ... make but a pledge & earnest of the pious Christians happines ... [A] conscience as tender as Religion requires doth not hinder any truly worthy action. But it doth oftentimes ingage us to, and positively injoin Acts of Heroick vertue. (BOA §3.3.6–8: 225–6)

4. The Christian Doctrine is more compleat then that of Aristotle and others, shewing Diverse things to be great Dutys, some whereof Heathen Legislators & Philosophers did not prescribe as Dutys and others they did but lightly mention ...

2ly. Many parts of the Christian Morals are grounded upon Considerations peculiar to the Christian Religion ...

(p. 88) 3ly. The Christian Doctrine furnishes us with higher aimes & motives to Piety & Vertue than the Heathen Ethicks, such as are the desire of pleasing, of imitating, & of resembling God ...



4ly The Christian Doctrine gives greater helps and encouragements to the practise of Piety, and all sorts of vertues then Heathen Moralists could afford their Disciples, for it ... supplys us with the powerful & supernatural [aid] of the Holy Spirit of Grace, which exceeds the highest helps that mere morality can afford & [is] sufficient to elevate the true Christians mind to an Heroick pitch of Vertue, & enable him to say with an Apostle, I can do all things thrô Christ that strengthens me (Philip 4: 13).

5ly The Christian Doctrine proposes higher recompences to pious & vertuous men than the Heathen Legislators or Philosophers were able to give (BOA §3.3.10: 227–8).

### 3.4.3 Ethics and Non-Human Animals<sup>36</sup>

#### 3.4.3.1 Boyle's Early Views

Boyle's early interest in theology and morality inspired a short piece, cast in the form of a letter, in which he remarks, 'I know [you] to be too religious a Votary to Equity, & too prodigall a Practiser of Mercy, to quarrell with me, tho mine extend unto the very Beasts' (BP 37 186<sup>f</sup>; transcribed in Oster 1989). Boyle continues with a number of arguments, many though not all theologically based, in favour of this stance, which is, however, scarcely consistent with his later experimental activities. That in turn raises the question: did Boyle change his theoretical views, and if so, why?

Boyle offered a number of arguments in favour of treating non-human animals compassionately. 'We deceive our selves to fancy a Right in man to any other Dominion over the Creature, then what will make us through them more instrumentall to the Glory of ... God who ... , as he allows us to make them subservient to our Necessitys & Conveniencys; so he intends them also to such a happynesse, as they are capable of without crossing that superior End' (BP 37, 187v–8r).<sup>37</sup> God looks after both men and beasts, as Psalms 147 and (especially) 104 make clear (see e.g. Psalm 147: 9 and Psalm 104: 10–22). Indeed, God explicitly commanded Noah to save *all* the animals, noxious species as well as beneficial ones, 'when there needed nothing to destroy them but not to save them', which also suggests that they were made 'for other Ends, besides Man's Service and Advantages' (BP 37, 189<sup>f</sup>; (p. 89) Genesis 6: 19–20). Moreover, 'Since ... we see Mercyfulnesse to beasts, made a Character of a Just man by the Wise man, & the Contrary condemned by an Angell, I am bold to fancy, that there May be such an Injury done to Beasts in this life, as men may be accountable for in the next: ... there is no restriction annex to that Dreadfull ... Judgment without mercy upon him that hath showed no mercy'.<sup>38</sup> Again, assuming either that 'brute animals do not know the future', or more simply that they are mortal, Boyle concludes that it is therefore worse to torment a brute than a human 'who is able to sweeten his present ... sufferings by the hope of a future, or Enjoyment of an other happyness'.

#### 3.4.3.2 Boyle's Later Views

How do these arguments fit with the activities of the later Boyle? Not too well. Boyle practised vivisection, and managed to kill a great many animals which were small enough to fit into his vacuum chamber. Vivisection could be justified because there were 'divers things in Anatomy, as particularly the motion of the Blood and Chyle cannot be discover'd in a dead dissected Body ... that may be seen in one open'd alive; it must be very advantageous to a Physitians Anatomical knowledge, to see the Dissections of Dogs, Swine, and other live Creatures, made by an inquisitive Naturalist' (*Usefulness* 2, *Sect. 1*, B 3: 299).

Nonetheless, though Boyle certainly experimented with living animals, his terminology shows at least the *semantic* persistence of his earlier views. Though the twin pressures of scientific interest and his acceptance of Cartesian dualism led him away from his earlier position, his language remained unCartesian throughout.

#### 3.4.3.3 Boyle's Practice

Boyle writes,

having divers times try'd the Experiment of killing Birds in a small Receiver, we commonly found, that within half a minute of an hour, or thereabouts, the Bird would be surpris'd by mortal Convulsions, and within about a minute more would be stark dead, beyond the Recovery of the Air, though never so hastily let in. Which sort of Experiments seem so strange, that we were oblig'd to make it several times, which gain'd it the Advantage of having Persons of differing Qualities, Professions and Sexes (as not onely Ladies and Lords, but Doctors and Mathematicians) to witness it. (*Spring of the Air*, B 1: 286)

On occasion, during these witnessed experiments, spectators would intervene. A 'great Person ... rescu'd [a bird] from the prosecution of the Tryal'. Another (p. 90) bird, 'cast into violent Convulsions, and reduc'd into a sprawling condition, upon the Exsuction of the air', was saved 'by the pitty of some Fair Lady's'.<sup>39</sup>

We notice that the birds' *sufferings* are not in question, and that they are fit objects for *rescue* and *pity*. Having asked himself, in connection with this experiment, whether the expiration was a result of the animals simply being *accustomed* to breathing air, Boyle wondered whether foetuses that had not yet started breathing would die as quickly: 'I had thoughts of conveying into our Receiver young ones, ripped out of the wombe of their Dammes, with their involving Coates intire, but could not procure them' (*Spring of the Air*, B 1: 292). Sometimes, however, he could:

We took a Bitch that was ... almost ready to whelp, and having caus'd her to be hang'd, we presently open'd her *Abdomen*, and found four Puppeys in her Womb; one of these we took out, and having freed him from the Teguments that involv'd him ... we observ'd that he quickly open'd his mouth very wide, mov'd his Tongue, and exercis'd Respiration; then we open'd both his *Abdomen* and Chest, and cut asunder the *Diaphragme*, notwithstanding which, he seem'd often to endeavour Respiring, and mov'd in a notable manner, both the Intercostal Muscles, part of the *Diaphragme*, the Mouth and the Tongue. (*Spring of the Air*, B 1: 289–90)

There seems, perhaps, too little trace of the earlier Boyle here (*Spring of the Air*, B 1: 286–7).<sup>40</sup> However, if his later views allowed practices inconsistent with his earlier views, his *language* remained consistent with his early views, containing terms such as 'torture', 'tormenting', 'cruelty', 'sufferings', and 'pity'. And it should probably be said, too, that he was often, if apparently unwittingly, fairly callous about humans as well, so his treatment of animals should be viewed against the general background of sensitivity displayed, both by Boyle and by others of his class and time.

### 3.5 Boyle's Legacy

Boyle, writing as a young man, tells us, perhaps a trifle smugly, that

Lying was a Vice both so contrary to his nature & so inconsistent with his Principles, that as there was scarce any thing he more greedily desir'd then to know the Truth, so was there scarce any thing he more perfectly detested, then not to speake it. Which brings into my Mind a foolish Story I have heard him Jeer'd with, by (his Sister,) my Lady Ranalagh; how (p. 91) she having given strict order to have a Fruit-tree preserv'd for his sister in Law, the Lady Dungarvan, then big with Childe; he accidentally comming into the Garden, & ignoring the Prohibition, did eat halfe a score of them: for which being chidden by his sister Ranalagh; (for he was yet a Childe;) & being told by way of aggravation, that he had eaten halfe a dozen Plumbs; Nay truly Sister (answers he simply to her) I have eaten halfe a Score. So perfect an enemy was he to a Ly, that he had rather accuse himselfe of another fault, then be suspected to be guilty of that. (Hunter 1994: 4–5)<sup>41</sup>

This honesty was active in other areas as well: Boyle sometimes seems to have been either the first bad, or the first honest, scientist. Others before Boyle report experiments, but their experiments strikingly often yield precisely the expected results. Boyle, on the other hand, seems to have had a real world laboratory. Experiments come to a halt in the middle because something gets broken, or spilled, or lost.<sup>42</sup> Hypotheses are tested, and the results fail to give the desired result (see, e.g. *Spring of the Air*, B 1: 228–9). Boyle, nonetheless, reports his experiments as they really took place, and reports them,

moreover, with an exactitude that allows of easy replication (see, e.g. *Spring, Continuation*, B 6, *passim*).

That, I think, is part of Boyle's legacy: he had an uncompromising honesty in his scientific work, and, as far as he could, given the beliefs instilled in his childhood, in his theological endeavours.<sup>43</sup> Consonant with this is Boyle's antipathy to systems. Presenting your results as part of an all-encompassing system, he felt, was triply unwise. Someone who writes

Systematically, *first*, ... will be obliged (that he may leave nothing necessary undeliver'd) to say divers things that have been said (perhaps many times) by others already, which cannot but be unpleasant, not onely to the Reader, but (if he be Ingenious) to the Writer. *Next*, there are so many things in Nature, whereof we know little or Nothing, and so many more of which we do not know Enough, that our Systematical Writer, though we should grant him to be very Learned, must needs, either leave divers things that belong to his Theme untreated of, or discourse of them slightly, and oftentimes (in likelihood) Erroneously. So that in this kind of Books there is always much said that the Reader *did* know, and commonly not a little that the Writer *does not* know. And to this I must add in the *third* place, that Natural Philosophy, being so vast and pregnant a Subject, that (especially in so Inquisitive an Age as this) almost every day discovers some new thing or other about it, 'tis scarce possible for a Method, that is adapted but to what is Already known, to continue (p. 92) Long the most proper; as the same Clothes will not long fit a Child, whose Age will make him quickly out-grow them. (*Excellency of Theology*, B 8: 82–3)<sup>44</sup>

As this makes clear, Boyle was also well aware of the way in which superficial or apparent explanations could interfere with accuracy. Boyle wanted, for example, to do away with the real qualities of the schools: 'the Schools have of late much Amus'd the World, with a way they have got, of Referring all Naturall Effects to certain Entities, that they call *Reall Qualities*'. These, though they had the Russellian advantage of theft over honest toil, were nonetheless unsatisfactory. By this 'way of dispatching difficulties, they make it very *easy* to solve All the Phaenomena of Nature in Generall, but make men think it *impossible* to explicate almost Any of them in Particular'. It was only the 'Comprehensive Principles of the Corpuscularian Philosophy' which would allow unmysterious explanations of physical phenomena (*Forms and Qualities*, B 5: 300–1).

Boyle on various occasions offered a number of principles which clearly informed his experimental practice. Here is one set 'about the use of Experience in Natural Philosophy':

That Sense is not to be lightly neglected or distrusted, when being duely qualify'd 'tis conversant about its proper Object.

That the Testimony of Sense, is to be prefer'd befor the authority of Philosophers.

That the well circumstanc'd Testimony of Sense is to be prefer'd to any Hypothesis, or to Ratiocinations not grounded upon Sense, or either Mathematical or Metaphysical Truths.

That numerous Observations of Sense ought to be diligently sought after and procur'd.

That the negative Testimonys of Sense ought not to be admitted without distinction & caution.

That the Informations of Sense assisted and hightned by Instruments are usually preferable to those of Sense alone.

That Artificial & design'd Experiments are usually more Instructive than Observations of Natures Spontaneous Actings.

'Tis unsafe to depart easily from Experience upon barely probable Arguments.

A Philosopher ought oftentimes to prefer a Luciferous Experiment before a fructiferous One, that is, to value

more an Experiment that gives much light Especially, to some important Theory, tho it seem not at present to have any Practical Use above an Experiment that is manifestly and directly & perhaps immediately of use or profit.

'Tis adviseable for a Naturalist to admit into his collection some Experiments that seem mean, trivial, and as to immediate use barren.

Tis very fit, that a Naturalist should Examine diverse of the Experiments or matters of fact that are handed to us by popular Tradition.

It may oftentimes be useful to reiterate Experiments of whose Truth we are perswaded. (BP 9: 31)

(p. 93) It is, perhaps, unnecessary, or almost unnecessary, to mention the considerable influence Boyle had on Locke. Locke, as is well known, was willing, in comparison with Boyle, Sydenham, Huygens, and Newton, to be an '*Under-Labourer ... clearing the Ground a little, and removing some of the Rubbish, that lies in the way to Knowledge*' (Essay: 10). However, Boyle too was willing to perform such intellectual manual labour, particularly in theological areas: 'For in this spiritual warfar against Atheists & other unbeleivers, Shovels & Pick-axes to clear & smooth the wayes, may in some cases be of use, as well as Swords & Bucklers' (B 14: 281). Boyle's views on medicine were clearly found important by Locke, as were his careful accounts of correct experimental procedure (Anstey 2011).

Boyle's uncompromising insistence on the priority of experiment over theory makes him a central figure in the type of scientist Cotes tells us Newton emulated, 'those whose natural philosophy is based on experiment' (Preface, *Principia*: 386)

Newton learned the principles of making experiments from such masters as Robert Boyle and Robert Hooke. He became acquainted with the corpuscular philosophy ... by reading works of Boyle and from the writings of Pierre Gassendi and Walter Charleton. Thus, Newton was informed of current thinking in science by learning from great masters, the leading figures of an age well described as 'the century of genius'. (Cohen and Smith 2002: 16)

I. Bernard Cohen points out that 'Newton's views concerning density were strongly influenced by the pneumatic experiments of Boyle and others', and William Newman notes that '[a]mong the most prolific of the English commentators on van Helmont were two authors who would form the object of Newton's intense scrutiny: Robert Boyle and George Starkey, who together supply over one hundred pages of extracts in Newton's most important chymical laboratory notebook'.<sup>45</sup>

Finally, we might note that Boyle was well aware of human frailty in himself and others. In theology he tells us, 'the Authority of the church with the general consent of Learned Men, may sway with me, as long as I have no cogent Reason to be of another opinion; but if I can light upon any demonstrative proof for a differing opinion, I would follow my own private judgment against the general consent' (BOA 4.2.10: 362). And in natural philosophy, too, he was aware of the weakness of human nature, and we may, perhaps, let him have the last word on the matter:

Philosophers are subject to humane frailties in general, & not only so, but to personal weaknesses & defects, as lazynes, envy, ambition, Arrogance, Hatred &c. They often contradict one another, and not seldom themselves. The many of them have been actually mistaken, & some of them grossly so. (BP 9: 34)

(p. 94)

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## Notes:

(1) *Certain Physiological Essays*, B 2: 28–9. Boyle makes a similar point in ‘The Author’s Preface’ to *Cold*, B 4: 219.

(2) The Royal Society’s collection of Boyle’s unpublished manuscript remains contains some 15,000 folios in 7 volumes of letters, 46 volumes of papers, often fragmentary (BP), and 19 volumes of notebooks and associated papers (MS).

(3) Manuscript deletions or duplicated words are omitted; and Boyle’s insertions are included without comment. For permission to publish my transcriptions of items from the *Boyle Papers* I am grateful to the Librarian and Fellows of the Royal Society. References to Boyle’s published works are to short titles.

(4) The definitive biography of Boyle is Hunter 2009.

(5) Boyle seems to have spent most of the preceding two years in Geneva, depending on his tutor, Marcombes, for financial support. See further Hunter 2009: 52–3, and BOA 30–5.

(6) BP 37: 182r–v, Hunter 1994: 17–18. These doubts persisted throughout Boyle’s life. See Hunter 2000b: 118 and, for more detail, Hunter 2009.

(7) Cf. BOA 23–4 and *Christian Virtuoso I*, Appendix, B 12: 421.

(8) On Boyle’s scruples in religion and science see Hunter 1994, lxxiii–ix, and Hunter 2009.

(9) Lawrence Principe and Michael Hunter have pointed out that this change in Boyle’s primary interest is mirrored not only in the content of his writings, but in the very style of those writings (Principe 1994, 1995; Hunter 2000a).

(10) See, e.g. BOA §3.4: 233–52; *Christian Virtuoso I*, B 11: 295.

(11) Cf. Boyle’s remark that there is ‘One thing which I would gladly recommend and inculcate to you, namely, that *Those Hypotheses do not a little hinder the progress of Humane knowledge that introduce Morals and Politicks into the Explications of Corporeal Nature, where all things are indeed transacted according to Laws Mechanical*’, *Mechanical Origin of Qualities*, B 8: 417.

(12) In *Usefulness I* (B 3: 255 and n.) Boyle refers with approval to Lactantius’ attack on the Lucretian account of the generation of animals (*Divinae Institutiones*, Book 2, ch. 12 in Lactantius 1844, vol. 6). Lactantius’ attack in Book 3 is also very much in line with Boyle’s views.

(13) That ‘In former ages men from mushrooms grew’ is an ‘old tradition’ mentioned by Ovid in *Metamorphoses*, VII, a work often quoted by Boyle.

(14) BP 7: 121–2, BOA §3.6.30: 294. For Boyle on miracles see further BOA §3.6: 261–97.

(15) Boyle’s modal argument is discussed in BOA: 210–15. What follows is a more charitable account of it, with more attention paid to the acceptability of Boyle’s first premise.

(16) Boyle’s contemporary, Ralph Cudworth, put the matter more strongly: ‘[T]o deny and disbelieve all *Miracles*, is either to deny all Certainty of *Sense*, which would be indeed to make *Sensation* it self *Miraculous*; or else monstrously and unreasonably to derogate from *Humane Testimonies* and *History*’ (TIS: 709).



(17) Boyle does not here consider the possibility that something less than a *demonstration* might be available. His argument requires the opponent to provide an airtight demonstration though, as he is in other contexts aware, indeed insistent, something less stringent may suffice in such cases. See further MacIntosh 2005.

(18) Given Boyle's insistence on the existence of matters above human reason, the difference between these two formulations should have been, but apparently was not, glaringly obvious to him. A being 'as perfect as we are able to conceive' may be a long way from an infinitely perfect being.

(19) This manoeuvre of limiting God's perfections was also accepted by Descartes and Cudworth. For Descartes, see the replies to the first two sets of objections, particularly AT VII: 99–100, AT VII: 118–19, AT VII: 127, and AT VII: 150–1. For Cudworth, who mentions it simply as Descartes did, as a rather unimportant restriction ('the Idea of *God* ... is only the *Idea* of such a thing as hath ... in it ... all *Perfections* which are neither *Contradictious* in themselves, nor to one another'), see TIS: 724.

(20) See, e.g. BP 7: 192, B 14: 154. Boyle sometimes notices the logical possibility that God might have created matter 'incoherent' (e.g. *Usefulness I*, B 3: 248), but in general he adopts the position outlined.

(21) Boyle makes this point in a number of places. See, e.g. BOA §§4.5.2, 4.5.4: 370, 371; *Absolute Rest*, B 6: 194; *Usefulness I*, B 2: 48; *Forms and Qualities*, B 5: 353–4; *Final Causes*, B 11: 130.

(22) *Discourse on Metaphysics*, §6; Leibniz 1875–1890, 4: 431–2.

(23) We do not know *why* God made the universe with its present laws, but we do know that God 'did nothing without weighty reasons: but because those reasons are a priori & undiscoverable by us ... the onely Reason we can assign, is that it pleas'd God at the beginning of things, to give the world & its parts that disposition' (BOA §2.2.34: 143).

(24) *High Veneration*, B 10: 188–9. See also *Christian Virtuoso I*, *Appendix*, B 12: 380; BP 9: 40; BOA §2.2.32: 142.

(25) Human souls are 'imprisoned' by contrast with 'the angelical Community ... of Rational & Immortal beings not clog'd with visible Bodys' (BOA §3.5.20: 256). See further *Excellency of Theology*, B 8: 33.

(26) BP 4: 14, BP 7: 243, B 14: 271, BOA §3.5.1: 248.

(27) This is stressed in *High Veneration*, B 10: 176–7.

(28) *Usefulness I*, B 3: 257. '[W]e presume too much of our own abilities', Boyle wrote, c. 1680, 'if we imagine that the omniscient God can have no other Ends in the framing & managing of Things Corporeal, than such as we Men can discover' (BOA §3.6.3: 267).

(29) *Excellency and Grounds of the Mechanical Hypothesis*, B 8: 108.

(30) For a dissenting opinion see Smart 1987: 226 n10.

(31) These possibilities are explored by Boyle in *High Veneration*, B 10: 72–5.

(32) Romans 1: 20 was a standard text on which to base such a claim.

(33) See the *Excellency of Theology*, part II, §5, where Boyle discusses the dangers of system building at length.

(34) Distinguishing these further into first, second, and third qualities.

(35) One example among many: 'The Naturalist that is Religious, may by his deeper Inspection into the Creatures, as well Justify the Wisdom and Goodnes of God, as celebrate them' (BOA §3.4.17: 237).

- (36) Boyle's early views on morality and non-human animals are discussed at greater length in MacIntosh 1996.
- (37) Boyle notes scriptural backing for his claim at Psalm 50: 10–12, Haggai 2: 8, Ezekiel 16: 17–19.
- (38) BP 37, 190<sup>v</sup>–1<sup>r</sup>; Proverbs 12: 10; Numbers 22: 21–33. The 'judgment without mercy' is promised at James 2: 13.
- (39) On the importance of the publicity of experiment, their repeatability, and the variety of the witnessing audience(s), see Shapin and Schaffer 1985.
- (40) For a more charitable view of these experiments see Frank 1980, ch. 6, 'New Experiments on Respiration, 1659–1665'.
- (41) At the time Boyle would have been eight, his sister Katherine, Lady Ranelagh, twenty.
- (42) See, e.g. *Spring*, *Continuation*, B 6: 157; *Spring of the Air*, B 1: 296; *Self-moving Liquor*, B 9: 450–1; *Defence*, B 3: 58; etc.
- (43) In Shapin and Schaffer 1985 we are given a different picture of Boyle, as someone who *professes* reluctance to declare an opinion, who *endeavours* to appear reliable, who *displays* modesty, who *crafts* his 'literary technology' to 'secure assent', who has 'professions and displays of humility', etc. (Shapin and Schaffer 1985: 51–69, and elsewhere). For Shapin and Schaffer Boyle *professes* humility, modesty, honesty, and so on. They do not *say* he lacks these qualities, but the implicature is clear enough. Boyle's character *was* complicated—see Hunter 2009—but, whatever else, it was not, so far as I can see, as contrived as Shapin and Schaffer unrelentingly suggest.
- (44) For an interesting discussion of the various eighteenth-century systematizations of Boyle's works, see Knight 2005.
- (45) Cohen 2002: 59; Newman 2002: 359. It should be noted, though, that by his own admission Boyle, unlike Newton, was not a mathematician, and Newton's experimental practice (including his thought experiments) involved taking a mathematical approach to Boyle's and Bacon's historical method.

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## Isaac Newton

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## Abstract and Keywords

This chapter examines the contribution of philosopher Isaac Newton to early modern British philosophy, whose work, it suggests, can be divided into several stages. These include his works on mathematics in the 1660s, experimental optics in the 1670s, natural philosophy and the publication of his *Principia mathematica* in the 1680s, and his friendship and philosophical exchanges with other philosophers, including John Locke, G.W. Leibniz, and Richard Bentley in the 1690s. The chapter also highlights the influence of Locke and Francis Bacon on the works of Newton.

Keywords: Isaac Newton, British philosophy, mathematics, experimental optics, natural philosophy, *Principia mathematica*, John Locke, G.W. Leibniz, Richard Bentley, Francis Bacon

THERE was perhaps no more complex figure in seventeenth-century Britain than Sir Isaac Newton. An intensely private person who shunned public controversies, he was also a recognized public intellectual, a knight of the British Empire who rose to the Presidency of the premier scientific institution in Europe in the early eighteenth century, The Royal Society of London. A founder of modern mathematical physics, he was also a deeply religious man with numerous—often heterodox—opinions on biblical chronology, the history of Christianity, and theological matters, including the nature and status of the Trinity.<sup>1</sup> Newton's *Nachlass* includes not only hundreds of pages of work in mathematics, optics, and natural philosophy, but also numerous manuscripts dealing with alchemical experiments and the history of alchemical thought. Yet Newton never published his speculations and research in religion, theology, and alchemy: these aspects of his life were barely known during his lifetime outside of a very small circle of friends and colleagues.<sup>2</sup> Hence to understand the Newton who influenced the course of British intellectual life in the second half of the seventeenth century, we have to focus on the public (p. 97) side of the equation. Happily, the public Newton was a sufficiently formidable and complex character to capture our imagination.<sup>3</sup>

Even if we limit ourselves to the public Newton, however, there remains the following question: what place does Newton occupy within the canon of seventeenth-century British *philosophy*? During his well-known forty-year public career, Newton made fundamental contributions to modern mathematics (co-discovering the calculus and employing many novel geometric techniques), modern physics, experimental optics, and more generally to what was known at the time as *natural philosophy*. But unlike Locke or Francis Bacon, Newton never composed what we can straightforwardly regard as a philosophical treatise. Despite his wide-ranging interests, he never wrote a systematic account of his views in metaphysics, epistemology, ethics, or related fields (Cohen and Smith 2002: 1–4). Charting his influence on the course of early modern British philosophy is therefore a challenge. And yet there is no doubt that Newton's influence was immense and that we cannot understand the state of British philosophy in, say, 1700 without considering his influence. As with many thinkers, it can be useful to separate Newton's own research and writings, including his unpublished correspondence, on the one hand,

from the myriad ways in which his contemporaries characterized, criticized, and acknowledged that research and writing, on the other. In many cases, one can question whether a particular doctrine or claim that was historically regarded as ‘Newtonian’ can truly be traced to Newton himself. However, if Newton’s contemporaries agreed that some such doctrine or view was Newtonian in spirit, if not in letter, then it can perhaps be legitimately considered as part of his influence on the century.

To facilitate understanding, Newton’s work can be broken into several stages. After finishing his studies as an undergraduate at Trinity College, Cambridge in 1665, Newton did considerable work in mathematics (and other areas), rising to become the second Lucasian Professor of Mathematics at the University of Cambridge in 1669 (the first holder of the chair was his teacher, Isaac Barrow). In the early stage of his career, the 1670s, he made important contributions to experimental optics (discussed below) that helped solidify his reputation in England and abroad. During the 1680s, Newton made huge advances in natural philosophy, culminating in the publication of his *magnum opus*, *Principia mathematica*, in 1687 (with the imprimatur of the Royal Society). During the 1690s, among other things, Newton befriended John Locke and had several important philosophical exchanges with various figures, including G.W. Leibniz (the German philosopher and (p. 98) mathematician) and Richard Bentley (a London theologian). By the turn into the new century, ‘Newtonianism’ was a powerful intellectual force in England and was soon to be one on the Continent. But it remained controversial. In 1715, Leibniz articulated several powerful philosophical objections to Newtonianism in a series of letters sent to Princess Caroline of Wales and the theologian Samuel Clarke (a member of Newton’s circle in London). This ignited a major cross-Channel debate that precipitated the Leibniz–Clarke correspondence, perhaps the most influential philosophical exchange of the entire eighteenth century.

## 4.1 The 1670s: Hypotheses and Knowledge in Experimental Optics

Although generalizations about the history of science, like the history of philosophy, can be misleading, it is probably safe to say that according to the traditional view prevalent in Newton’s day, optics was considered a ‘mixed mathematical’ discipline separate from natural philosophy. The unclear ontological status of light—is it composed of a stream of particles, or is it a wave within some kind of medium, like waves on a lake?—may have contributed to the opinion that an overarching, systematic account of nature might lack any treatment of light. Since light rays travel in straight lines, many ancient and medieval thinkers were able to employ geometrical techniques to understand optical phenomena. But even in Newton’s day, there remained great uncertainty concerning the status of optics in relation to other aspects of the study of nature, and there was certainly no consensus concerning the mathematical status of optics or the status of any empirical knowledge of light that experimentation might afford.

The strongly negative reaction to Newton’s first published works in optics—his essays appeared in the *Philosophical Transactions of the Royal Society* between 1672 and 1675—may have been the origin of his well-known reticence to engage in philosophical disputation. But it also encouraged him to tackle a number of foundational questions in natural philosophy that would be the cornerstones of his mature work. When is a natural philosopher justified in presenting a hypothesis regarding nature? How much empirical information is required before one can claim to have *knowledge* of a given natural phenomenon? What is the relationship between the knowledge found in natural philosophy and the knowledge obtained in Euclidean geometry?<sup>4</sup> Newton grappled with these, and many related, questions (p. 99) in a somewhat ad hoc way, spurred on in most cases by requests for clarification from friends, and by demands for proof from foes. The debates concerning his conclusions in optics early in his career rendered Newton a kind of ‘accidental philosopher’, a status he would retain throughout the rest of his life.

From the point of view of the history of British philosophy, Newton’s actual experiments in optics are less important than the methodological debate they sparked. In his first paper of 1672 (Newton 1958: 47–59) Newton set out to determine, among other things, whether sunlight is homogenous or heterogeneous by allowing rays from the sun to pass through prisms in his college rooms. The then-popular view that sunlight is homogeneous was accompanied with the corollary that a prism, or

similar physical object, will ‘produce’ various coloured rays of light by modifying the sunlight in some way. In Newton’s opinion, his experiments indicated on the contrary that sunlight itself is heterogeneous, which means, in turn, that the prism through which a ray from the sun passes does not alter the natural light at all, but rather brings out the coloured rays that are its ordinary constituents (Sabra 1981: 231–97).

In the numerous exchanges that Newton’s original paper generated, and in his second paper of 1675, it quickly became clear that Newton’s critics did not accept his view that his experiments supported the conclusion that ordinary sunlight consists of many coloured rays.<sup>5</sup> But even more significantly, Newton and his critics could not agree on the proper interpretation of his claims in his optical essays. From Newton’s point of view, whereas the claim that sunlight is heterogeneous represented one of his principal contentions, and one of the contentions supported by his experimental evidence, the claim—which he made in passing—that light itself consists of particles (rather than waves) did not represent the key to his theory, and was not intended to be a conclusion drawn from the evidence. Newton did indeed believe that light is a particle rather than a wave—the debate concerning the nature of light, of course, continued into the beginning of the twentieth century—but he took this to be inessential to his theory of light, which was focused on the question of heterogeneity. Yet Newton’s critics, such as the important experimental philosopher Robert Hooke, who served as the curator of experiments at the Royal Society, took exception to this interpretation of Newton’s essays, contending that his *principal* view must be that light is particulate, rather than wavelike. These critics simply could not grasp the idea that Newton’s fundamental goal in his theorizing would be simply to present the experimental conclusion that sunlight is heterogeneous; they thought his goal must be to use some experimental results to ‘prove’ the overarching view that light is particulate. The classic debate about the nature of light, from their point of view, must be the centrepiece concerning any theorizing in optics. Moreover, they seemed to suggest (p. 100) at times that the goal of optics must be to uncover the true nature of light. Presupposing this assessment of Newton’s goals, they concluded that he had not provided sufficient evidence to reach the conclusion that light is particulate, since their wavelike interpretation also could account for the point about sunlight’s heterogeneity. That is, they took the two hypotheses regarding the fundamental nature of light to account for the data equally well. The data therefore could not be evidence for one view.

From the perspective of many later Newtonians, this episode illustrates a key difference between the scientific practices of Newton and those of his principal interlocutors and critics in the mid-to-late seventeenth century. Whereas Newton’s critics took his experimental data to be *relevant* solely if they supported a hypothesis concerning the fundamental nature of light, Newton himself may have thought that the goal was to uncover sufficient experimental evidence to support a more modest conclusion regarding the rays of sunlight—it would be modest because it would be silent on the more difficult issue of determining the fundamental nature of light. For later Newtonians, Newton’s modesty in this debate was a key virtue: it helped to indicate that science should not be focused on questions—such as the basic nature of light—that could not be resolved on the basis of empirical evidence. For Newton’s critics, however, his focus on the experimental evidence showed a somewhat narrow-minded approach to optics that left the most important question unanswered. To Newton’s followers, he was helping to transform natural philosophy from a largely speculative affair into an enterprise focused on questions that could in principle be resolved by appeal to evidence gathered through experiment and observation. These themes would remain central to Newton’s work, and to its reception, throughout the rest of his career.

## 4.2 The 1680s—Part A: from Cartesianism to Newtonianism

### 4.2.1 The Cartesian Background to Newton’s Work

Although Aristotelian natural philosophy was a prominent subject of discussion in Britain during the first half of the century, it is safe to say that by some time in the second half, Cartesianism was considered by many to be the most significant modern innovation among natural philosophers. John Heilbron writes that as of the mid-seventeenth century, ‘Descartes then replaced Aristotle as the foil against which British physics tested its mettle[sic.]’ (1982: 30). Unlike Descartes, who spent much of his career responding to various ideas and doctrines in scholastic metaphysics (p. 101) and among Aristotelian

natural philosophers, Newton largely dispensed with this approach—he began his work where Descartes had left off. Although the education he received at Trinity College, Cambridge, was still focused on neo-Aristotelian ideas in philosophy, he himself focused especially on Descartes’ work, even more perhaps than the work of his countrymen Hooke, Hobbes, and Boyle. Among other things, he carefully read Descartes’ *Geometry*—in the Latin edition by van Schooten—*Meditations*, and *Principles*.

Descartes originally developed a systematic account of the natural world in his aptly titled treatise, *The World*. However, when he learned of Galileo’s difficulties with the Catholic Church in 1633 due to the controversy concerning the motion and position of the Earth within the solar system, Descartes refrained from publishing his treatise, which advocated a similar ‘Copernican’ position. It would be eleven years before Descartes would publish a systematic work in natural philosophy—he titled it *Principia philosophiae*, or *Principles of Philosophy* (Garber 1992). In Newton’s milieu, Descartes’ *Principles*, along perhaps with some of his other works, was considered the most systematic and promising attempt at reinvigorating natural philosophy in the post-Aristotelian environment. In part two of the *Principles*, Descartes had argued that three fundamental laws of nature can be deduced from the nature of God and of body (both of which he addressed earlier in part one, and in his prior, more famous work, the *Meditations*). The first two laws provide us with one of the very first modern articulations of what we call the principle of inertia. Moreover, Descartes took the key step of rejecting the old neo-Aristotelian bifurcation of nature into the fundamentally distinct earthly (or ‘sublunary’) and heavenly (or ‘superlunary’) realms by applying the principle of inertia to *all motion throughout nature*, whether on earth or in the heavens. Hence Descartes believed not merely that ordinary objects on earth, such as an apple thrown from one person to another, follow the inertial principle, but also that the heavenly bodies, from the moon to the sun to the outer planets and the stars, follow that same principle. This served to unify astronomy and terrestrial physics in an especially important way. But it also presented the crucial view that nature is *uniform* in the sense that a specific set of physical laws governs all of its processes and regions, at both the microscopic and the macroscopic level.<sup>6</sup>

Newton worked in the wake of Descartes’ fundamental reform of natural philosophy (Koyré 1968: 53–114; Cohen 1990; Stein 2002). He, too, presupposed that nature is uniform, that astronomy and terrestrial physics must be unified, and that natural processes are governed by a small set of basic laws that we can, at least in principle, discover through various means (although he rejected the view that we can deduce laws from features of God). Newton followed Descartes in a more specific way as well: he also took the principle of inertia to be a fundamental law of (p. 102) nature—although his formulation of the principle, in his first law of motion, is more familiar to modern readers, and crucially involves the Newtonian idea of an ‘impressed force’—that governed the motions of all bodies, whether terrestrial or heavenly. Hence for Newton as for Descartes, the heavenly bodies, like the planets, will follow a curvilinear orbit around the sun only if something causes them to deviate from the inertial paths along the tangents to those orbits. The principle of inertia therefore serves to guide the natural philosopher in searching for the cause of the planetary orbits. This is certainly a foundational principle of the natural philosophy of the latter half of the seventeenth century.

#### 4.2.2 From Descartes’ *Principia* to Newton’s *Principia*

Although Newton worked within the same broad tradition in natural philosophy as Descartes, he often emphasized his many significant differences with the Cartesians. In this regard, he is a very typical late seventeenth-century British philosopher (Locke is perhaps the most famous critic of Cartesian *metaphysics*). His distancing began with the title he chose for his *magnum opus*: whereas Descartes had provided us with the ‘Principles of Philosophy’, Newton sought to underscore the fact that *his* principles were *mathematical* in character, hence the ‘Mathematical Principles of Natural Philosophy’. Newton often focused on two basic disagreements with the Cartesians concerning the character of the principles found in natural philosophy. First, he argued that Descartes had failed to use geometrical techniques to study the motions of bodies—this was the focus of the first book of Newton’s *Principia*. Instead, despite his status as one of the great geometers of the seventeenth century, Descartes typically settled in his *Principles* for a qualitative analysis of natural phenomena, including those involving motion—this is immediately evident if one considers the kinds of explanation provided in part two of the *Principles*. Second, he argued that Descartes had mistakenly believed that we could achieve non-empirical knowledge of

the laws of nature by deducing them from our more fundamental, or metaphysical, knowledge of God and of the essence of material bodies.<sup>7</sup> Newton trumpeted the (perhaps more familiar) view that our knowledge of the laws of nature is fundamentally empirical in character. He may (p. 103) also have been willing to accept the consequence that our understanding of the laws of nature can always be revised in the light of further empirical evidence.<sup>8</sup>

Many of Newton's followers took the differences between the Newtonian and the Cartesian traditions in natural philosophy to be even starker. They argued that Descartes' programme in natural philosophy was fundamentally hampered by his opinion that metaphysics—in particular, a basic understanding of God's nature, of the nature of the human mind, and of the essence of material objects—must serve as a kind of foundation for any knowledge of nature. They took metaphysical issues to be subject to constant debate and discussion, and therefore regarded them as essentially irrelevant to natural philosophy, which aims at achieving consensus by focusing specifically on questions that can be resolved through appeal to empirical evidence (hence an important link was established with Newton's own interpretation of his earlier work in optics). They also argued that natural philosophy must not only rid itself of metaphysics, it must focus exclusively on empirical questions that can be investigated through experiments or observations. In this way, Newton's rejection of Cartesian natural philosophy was trumpeted as a great inspiration for the development of what was called the 'experimental philosophy' in the late seventeenth and early eighteenth centuries.<sup>9</sup>

From a somewhat different perspective, one that focuses especially on a famous unpublished essay of Newton's now called *De gravitatione* (after its first line), it is more accurate to think that Newton did not simply eschew the kind of metaphysical issues that preoccupied Descartes in his anti-scholastic work, but rather replaced Cartesian metaphysics with a version of his own. In *De gravitatione*, which was first published in 1962,<sup>10</sup> Newton explicitly rejects Descartes' view that extension is the essence of body, contending, as Locke would in the *Essay*, that body and space—or extension—are in fact distinct. Unlike any region of space, bodies are impenetrable and mobile entities whose motions are governed by various physical laws. Hence he rejected the Cartesian plenum, along with Descartes' view that all motion—in the proper or philosophical sense of the term—involves a change in relations among material bodies, contending that we should instead (p. 104) conceive of true motion in terms of a body's change in spatial position, independent of any relations it may bear to other bodies (see the following section). So for Newton, we conceive of space as a Euclidean magnitude that may not be occupied by any bodies—an impossibility for the Cartesian defender of the plenum—and we conceive of bodies as occupying various sectors of that space in virtue of their impenetrability and extension. Although Newton does not mention his famous three laws of motion in *De gravitatione*—they were first published in the *Principia* in 1687—he already argued in this text that we must consider bodies to undergo law-like transfers through space.<sup>11</sup> These views clear the way for Newton's later work in natural philosophy, enabling him to conceive of various bodies as moving through empty space under various causal conditions. Cartesian metaphysics is incompatible with this kind of theorizing.

## 4.3 The 1680s—Part B: Newton's Natural Philosophy

### 4.3.1 Space, Time, and Motion

Perhaps the most philosophically influential, and controversial, section of Newton's *Principia* is the Scholium that follows the definitions in the opening of the text (*Principia*: 408–15). After Newton defines various technical terms—such as the quantity of motion, the quantity of matter, also known as mass, and centripetal force—he contends that space, time, and motion are too well known to be susceptible of, or to require, definitions. However, he argues that the 'common' (*vulgare*) conceptions of space, time, and motion are not adequate to the task he has set himself in the *Principia*, which is to determine the 'true' motions of bodies and then from there to determine the forces that cause those motions by acting on those bodies. Hence he introduces his famous threefold distinction between absolute, mathematical, and true space, time, and motion, on the one hand, and relative, common, and apparent space, time, and motion, on the other. Notice that Newton does not contrast the 'true' motion of a body with its 'false' motion; instead, he distinguishes between a body's true motion and its merely apparent motion. For instance, the earth may *appear* from various terrestrial points of view to be at rest, but it might



still truly move for all that. As this example suggests, it (p. 105) seems obvious even to the untrained eye that we might want to distinguish between true and merely apparent motion, on both philosophical and more ordinary grounds. Indeed, Descartes himself distinguishes in part two of his *Principles* between the ‘common’ (*vulgare*—the same Latin term used by Newton) and the ‘true’ view of motion. In part II, section 25 of his *Principles*, Descartes takes the true motion of a body to be as follows: ‘motion is the transfer of one piece of matter or one body from the vicinity of the other bodies which immediately touch it, and which we consider to be at rest, to the vicinity of others’ (CSM 1: 233). Since Descartes regarded the world as a plenum, he thought that any motion of any body must involve a change in its relations to other bodies—his ‘true’ view of motion singles out those bodies that surround a given body as the salient ones for its motion. This is precisely the kind of view that Newton rejected in *De gravitatione*.

From Newton’s point of view, we need a concept of true motion for natural philosophy, but the Cartesian one is fundamentally flawed.<sup>12</sup> Perhaps the most famous discussion in the Scholium, the so-called bucket experiment, may have been designed to convince readers that Descartes’ conception of true motion must be rejected. (It also had the purpose of indicating how true motion as understood by Newton could be detected empirically, e.g. through inertial effects.) In this discussion, Newton asks us to imagine that a bucket full of water is suspended from a rope (*Principia*: 412–13). The rope is then twisted enough so that when it is released, the bucket begins to spin around. As the bucket spins, the water’s surface becomes concave; at the height of the bucket’s spinning, it and the water are both spinning in the same direction and in the same way such that the water is not moving relative to the bucket. From Descartes’ perspective, for the water to ‘truly’ move is for it to be transferred from the vicinity of the objects surrounding it to another vicinity, when the former vicinity is regarded as being at rest. Now if we do not regard the bucket as at rest, we cannot regard the water as moving—but then how do we grasp the concavity of the surface? Alternatively, if we do regard the bucket as at rest, we still cannot regard the water as moving, because its position relative to the bucket (at the height of the spinning) does not change. Newton harnesses our ordinary idea that the water is moving in order to indicate that we should not construe true motion as a change in object relations à la Descartes. Instead, we ought to construe true motion as (p. 106) a body’s absolute motion, which is to say, its change of absolute place (its change of location within absolute space). Although we cannot detect absolute space itself, since Newton conceives of it as empty and imperceptible, we can detect the inertial effects of rotating bodies (in this case, the concavity of the water).

#### 4.3.2 Forces and the ‘Mechanical Philosophy’

By the middle of the seventeenth century, there was close to a consensus among philosophers that causation within nature ought to be understood ‘mechanically’. This was taken to mean many things by many thinkers, but the most general and common view was that natural change was due solely to the impacts of material bodies upon the surfaces of other material bodies. It was usually taken as a corollary that material bodies cannot act on one another from a distance—their surfaces must be in physical contact for them to interact causally. From continental philosophers such as Descartes to British ones such as Locke, what came to be known as ‘the mechanical philosophy’ seemed to be the most promising research programme within natural philosophy and perhaps within philosophy more generally.<sup>13</sup> Most of the mechanical philosophers theorized causation without recourse to any notion of *force*; but for those, perhaps like Descartes (see CSM 1: 242), who made use of this notion, they reminded their readers that any understanding of the forces of nature must be compatible with the overarching mechanist view that all natural change occurs solely through contact among material bodies. Hence for one body to impress a force on another body, the two bodies must be in contact with one another.

For his part, Newton placed the notion of force at the centre of his work in the *Principia*; indeed, this is the primary causal notion within his programme for natural philosophy. In the preface to the first edition of the *Principia*, he writes: ‘For the basic problem of philosophy seems to be to discover the forces of nature from the phenomena of motions and then to demonstrate the other phenomena from these forces’ (*Principia*: 382). In book I of the text, Newton suggests that he employs a merely ‘mathematical’ notion of force. This has been taken to mean many things by many philosophical readers of his text. In book I, Newton does not focus on the observationally determined motions of the actual bodies in our solar system; instead, he focuses on what might be called the more abstract question of how we should understand a wide range

of motions, or of bodily trajectories through space (where we suppose that no medium impedes the motions). In book II, Newton considers the various motions of bodies through resisting (p. 107) media, in part because the most prominent view of planetary motion at that time, the Cartesian view, held that the solar vortex carried the planets along their orbits. It is only with book III, Newton reports, that we come down to ‘physical’, rather than merely ‘mathematical’, questions; it is here that we engage with the observed motions of the actual bodies in the solar system: the earth, moon, sun, and planets (including Jupiter and Saturn). In a famous letter of 1686, written while he was composing the *Principia*, Newton informed Halley that it is only with the inclusion of book III, with its focus on the actual bodies and motions in nature, that his text could be considered a work in natural philosophy. Otherwise, it would have been more aptly called *De Motu*, a work on motion (Newton 1959–1977, 2: 437).

Although Newton’s relationship with the mechanical philosophy—and with the various mechanists, such as Huygens and Leibniz, who became his most vociferous philosophical critics—is complex, it is safe to say that he severed his notion of force from the view of causation defended by the mechanical philosophers. That is, he did not stipulate or presuppose that for one body to impress a force on another body, the two must be in contact with one another. This was no mere slip of the pen on Newton’s part, as can be seen from two brief examples. First, the first law of motion reads (*Principia*: 416): ‘Every body perseveres in its state of being at rest or of moving uniformly straight forward, except insofar as it is compelled to change its state by forces impressed’. Since gravity is a kind of centripetal force, and the latter for Newton is one kind of impressed force, this law does not stipulate that a body’s state of motion can be altered only through contact; it can be altered through an impressed force that may not involve contact. Second, in the third and final book of the *Principia*, Newton presents his theory of universal gravity, according to which massive material bodies, such as the sun and earth, impress a force—gravity—on one another across vast distances in the solar system. Many of Newton’s readers were sceptical of this idea, noting that it seemed to imply that the sun and the earth interact causally with one another—accelerating each other—without being in physical contact at all. Thus the key Newtonian concept of causation—force—has been severed from any mechanist conception.

Newton addressed his movement away from mechanist ideas of causation in a direct way when discussing his third law of motion. He argued that the third law applies not only to ‘actions’ involving contact between material bodies, but also to interactions not involving contact of any kind. The third law reads as follows (*Principia*: 417): ‘To any action there is always an opposite and equal reaction; in other words, the actions of two bodies upon each other are always equal and opposite in direction’. Newton then gives some examples of interactions between bodies in contact that involve this law: for instance, he says if I press a stone with my finger, the stone will also press my finger. But in the Scholium that follows the Corollaries to the Laws of Motion, Newton is concerned to show that this law also applies to bodily interactions that do not involve contact—for ease of reference, Newton says that the law applies also to ‘attractions’ (*Principia*: 417, 427–8). His (p. 108) argument for this conclusion is complex and was the subject of some discussion with Roger Cotes, the editor of the second edition of the *Principia*.<sup>14</sup> But in brief, Newton tries to use the widely accepted first law of motion<sup>15</sup> as part of the basis for his controversial conclusion that two material bodies must attract one another in accord with the third law. He claims that if their attraction of one another were not subject to the third law—for instance, if one body, A, attracted another, B, in a way that was not balanced by B’s attraction of A—then there would be a violation of the first law, for one body would attract the other body to it without end, which means the two would accelerate without any impressed force causing their acceleration (*Principia*: 428). Hence even at the very beginning of the *Principia*, Newton suggests that two material bodies can be in law-like causal interaction with one another even if they are not in contact. This represents a sharp departure from the widespread mechanist view that the laws of nature must be explicable in terms of the universal properties of material bodies—it was often thought that these properties would include, or perhaps be limited to, size, shape, mobility, and solidity (see Ayers 1981). For Newton certainly did not claim that we can understand (say) some action–reaction event involving the earth and the sun by considering the properties of these bodies: the properties of these bodies do not give us any explanation of why the third law governs their motions and causal interactions. Some of Newton’s contemporaries argued that the size, shape, motion, and solidity of a body can indeed explain its contact-interactions with other bodies, but the non-contact-interactions governed by the third law are a different matter.

More than any other philosopher, Leibniz bemoaned what he took to be Newton's deviation from the previously established mechanist consensus concerning causation within nature. However, it would be unwise to infer from this episode that Newton himself embraced the conclusion Leibniz attributed to him, namely that physical bodies can act on one another at a great distance across empty space (see the following section). Throughout the rest of his career, Newton made many comments that have often been interpreted to mean that he, too, denied the possibility of action at a distance, despite his willingness to jettison any strong commitment to the mechanical philosophy. Many commentators have wondered how Newton could successfully achieve this balancing act: in particular, how could (p. 109) Newton take the third law to govern non-contact-interactions, and how could he assert that all massive bodies gravitate towards all other massive bodies, without *ipso facto* endorsing action at a distance? This remains one of the driving questions of contemporary scholarship addressing Newton's philosophical views, and there is no consensus on how to understand this issue.<sup>16</sup> There is little doubt, however, that the significance of Newton's challenge to the mechanist programme was widely recognized by the time of his death in the early eighteenth century.

Although Newton's approach to understanding the forces in nature brought him into philosophical conflict with defenders of the mechanical philosophy, he himself remained silent on many other controversies concerning causation. For instance, despite his myriad reactions to Cartesian conceptions of space, time, motion, and causation, Newton never addressed the possibility that occasionalism—of the kind associated either with Descartes or later with Malebranche—might be the proper conception of all causal powers or causal relations within nature. His view that God is not merely omnipresent in his power, but substantially omnipresent throughout space (*Principia*: 941), might be thought to fit nicely with some version of occasionalism, but Newton apparently did not think that there was any overarching philosophical or empirical ground for denying that material bodies can engage in genuine causal interactions with one another. If anything, Newton greatly widened the scope of possible causal interactions among material bodies, expanding the philosophical landscape beyond the contact actions countenanced by the mechanists to include even the interactions of extremely distant bodies such as the sun and the earth. Newton saw causation everywhere.

## 4.4 The 1690s: Locke, Newton, and Bentley

### 4.4.1 Newton's *Principia* and Locke's *Essay*

Although the first editions of Newton's *Principia* and Locke's *Essay* were published a mere three years apart (in 1687 and 1690 respectively) their authors worked independently. Newton and Locke became friends in the early 1690s and may have influenced each other's thinking about philosophy, religion, and theology in various ways. Some historians think that each questioned the standard Anglican (p. 110) interpretation of the Trinity, contending that Jesus of Nazareth was not a divine figure on the same level as God the creator. But given their controversial and politically sensitive nature, these so-called anti-Trinitarian views were largely kept secret among a small circle of friends. With respect to their public views, Newton and Locke were often taken to represent two aspects of the same experimental-philosophical approach towards the close of the seventeenth century (cf. Stein 1990; Wilson 1999: 196–214; Domski 2012).

Locke's embrace of the mechanical philosophy, however, did bring him up against a central tenet of Newton's natural philosophy. For Newton's theory of universal gravity seemed to be in tension with mechanist views of causation. In the first edition of the *Essay*, Locke had written that bodies operate: 'by impulse, and nothing else' (*Essay* II. viii. 11). Bishop Edward Stillingfleet questioned this view in correspondence with Locke. In a famous exchange, Locke responded in part by reformulating his commitment to the mechanist view that all causation involving material bodies must be by contact (impulse) alone:

It is true, I say, 'that bodies operate by impulse, and nothing else'. And so I thought when I writ it, and can yet conceive no other way of their operation. But I am since convinced by the judicious Mr. Newton's incomparable book, that it is too bold a presumption to limit God's power, in this point, by my narrow conceptions. The

gravitation of matter towards matter, by ways inconceivable to me, is not only a demonstration that God can, if he pleases, put into bodies powers and ways of operation above what can be derived from our idea of body, or can be explained by what we know of matter, but also an unquestionable and every where visible instance, that he has done so. And therefore in the next edition of my book I shall take care to have that passage rectified. (Locke 1823, 4: 467–8)

In this way, Locke held the common view that Newton's theory of universal gravity in the *Principia* was incompatible with the mechanical philosophy, and when forced to choose between these two options, he evidently sided with Newton. Yet from Locke's point of view, Newton's theory does not render gravity 'conceivable': even if the theory of universal gravity is correct, it does not allow us to understand how matter—what Locke would call 'extended solid substance'—can interact gravitationally with other matter regardless of whether the bits of matter are in contact with one another (Downing 1997). As we have seen, Newton himself may have jettisoned the mechanist assumption that our basic conception of matter ought, in principle, to explicate interactions involving gravity.

#### 4.4.2 Gravity and God: Newton's Correspondence with Bentley

When the great English natural philosopher Robert Boyle died at the end of 1691, he endowed a lecture series designed to promote Christianity against what Boyle took to be the atheism that had infected English culture after the revolutionary period of (p. 111) the mid-century. The first 'Boyle lecturer' was the theologian Richard Bentley, who would eventually become the Master of Newton's *alma mater*, Trinity College, Cambridge, and who also worked under Locke's correspondent, Bishop Stillingfleet. When preparing his lectures for publication in 1692, Bentley conferred with Newton, hoping to solicit the great mathematician's help in deciphering enough of the *Principia* to use its results as a bulwark against atheism (Bentley 1976). Newton obliged, and a famous correspondence between the two began (eventually published as Bentley 1756). The exchange is of great philosophical interest, for Bentley elicited a number of important clarifications that have no peer within Newton's published *oeuvre*.

Bentley sought Newton's assistance in particular because he wanted guidance in divining how the theory of the *Principia* indicates that the solar system must have been designed by an intelligent agent and could not have arisen through the physical interactions of material bodies. In the first edition of the *Principia* in 1687, Newton had made such a claim in a very brief statement (Newton 1972, 2: 582–3; Cohen 1971: 154–6). In the second edition of the text (published in 1713), he removed that statement, replacing it with a more extensive discussion in the new section of the text, added to its end, called the 'General Scholium'. Through their correspondence, Bentley learned that from Newton's point of view, the positions of the planets relative to one another—and especially to the sun—indicate that mere chance, or the ordinary physical interactions of the planetary bodies, could not have placed each planet in precisely the right orbit to maintain a solar system like ours. With this argument, Newton seems to be indicating that mere chance would have produced an unstable planetary system, one in which the planets would eventually either be too strongly attracted to the sun, falling into it, or be too weakly attracted, flying off into space. In this episode, a theologian appeals to the new authority of Newtonian natural philosophy when attempting to undermine atheism. And that was apparently the very kind of interchange that Boyle had envisioned.

When historians and philosophers seek out Newton's views on action at a distance (discussed above), they typically consult a famous passage within one of his letters to Bentley. Many of Newton's interpreters had taken the *Principia* to involve a postulation of action at a distance between the planetary bodies when Newton wrote (e.g.) that the sun attracts the earth through its gravitational force. In a letter from 25 February 1692/3, Newton clarifies his view with a robust pronouncement:

It is inconceivable, that inanimate brute matter should, without the mediation of something else, which is not material, operate upon, and affect other matter without mutual contact, as it must be, if gravitation in the sense of *Epicurus*, be essential and inherent in it. And this is one reason why I desired you would not ascribe innate gravity to me. That gravity should be innate, inherent and essential to matter, so that one body may act upon another at a distance through a *Vacuum*, without the mediation of any thing else, by and (p. 112) through which their action and

force may be conveyed from one to another, is to me so great an absurdity, that I believe no man who has in philosophical matters a competent faculty of thinking, can ever fall into it. Gravity must be caused by an agent acting constantly according to certain laws; but whether this agent be material or immaterial, I have left to the consideration of my readers. (Bentley 1756: 26, modernized)

Once this letter became known, some interpreters argued that Newton had in fact rejected action at a distance between any material objects (including the planetary bodies) and that his theory of universal gravity in the *Principia* must be understood as being consistent with this rejection (Janiak 2008). But there is certainly no scholarly consensus on this matter (Henry 1994). For it is possible that despite the urgent and insistent tone of Newton's letter, he intended solely to rule out a specific view of action at a distance associated in his day with the Epicurean conception of the universe. Certainly, the correspondence with Bentley remains a crucial source for understanding Newton's ideas.

## 4.5 Circa 1700: Looking towards the Eighteenth Century

When Kant characterized the most significant conceptions of space and time in his *Critique of Pure Reason* (1781, first edition), he chose the 'Leibnizian' and 'Newtonian' views as his focal point. Indeed, even today, debates about space, time, and motion reflect some of the principal ideas articulated by Leibniz (and his followers) and by Newton (and his followers). One of Newton's most important contributions to the eighteenth century—and beyond—was his articulation of the distinction between absolute and relative space, time, and motion, a distinction that was rigorously rebutted by figures such as Huygens and Leibniz in the late seventeenth century. They rejected the Newtonian view on both empirical and (what might be called) metaphysical grounds. The most famous criticisms of Newton arose in the context of Leibniz's correspondence with Newton's friend and colleague, the theologian Samuel Clarke, in 1715–1716 (Clarke and Leibniz 1717; Bertoloni Meli 1999). As I say, their correspondence became perhaps the most significant philosophical exchange in the eighteenth century.

From Leibniz's point of view, the discussion in the Scholium to the *Principia* saddled natural philosophy with the view that infinite Euclidean space exists independently of the material objects that exist. Leibniz argued that this notion of 'absolute space' conflicts with the most fundamental principle of metaphysics, the principle of sufficient reason. If space exists independently of matter, and if (p. 113) God created matter at some point in the past, then God faced the question of where to create material objects within the infinite Euclidean space that existed prior to creation. The homogeneity of Euclidean space, however, indicates that God could not have had a reason to choose one region of space for the creation of matter, rather than any other region. Hence the creation of matter, according to the Newtonian characterization of space, lacked any reason, which is a violation of Leibniz's fundamental principle. This kind of criticism nicely exhibits Leibniz's overarching view that natural philosophy must be founded upon—or perhaps must presuppose—certain fundamental metaphysical principles (this includes the principle of the identity of indiscernibles, which is entailed by Leibniz's interpretation of the principle of sufficient reason). The development of natural philosophy, from his perspective, must always proceed in accordance with the basic doctrines established through metaphysical reasoning about the world. The view defended by Newton, and perhaps by Clarke, came to represent a contrary opinion, according to which research and theorizing within natural philosophy—about space, time, and motion, but also about causation within nature and related issues—cannot be hampered by prior metaphysical commitments or presuppositions.

It was common in the eighteenth century to identify a stream of thought called 'Newtonianism' with some overarching commitment to the experimental philosophy (McMullin 1985). This general conception of Newton's achievement and approach to problems in natural philosophy was easily buttressed by the sense that the *Principia*'s continental critics, whether Cartesian or Leibnizian in orientation, tended to reject the view that basic questions about forces or causation should be left open to empirical investigation. Hence Newton's supporters took his 'empiricist' approach to be contrasted with the seemingly a priori commitment to a mechanist view of causation on the part of the Continentals.

Yet the notion that Newtonianism should be understood straightforwardly as representing an experimental approach in



natural philosophy is simplistic. For as it turned out, Newton's view that we should conceive of true motion as absolute motion, as motion with respect to absolute space, was controversial among some of his contemporaries in the early eighteenth century, especially Berkeley. (This would in fact prefigure empiricist-style criticisms of Newton in the nineteenth century, made by Ernst Mach, among others.) The notion that in order to understand the true motion of bodies that we can perceive, we must postulate an infinite, empty, causally inert, Euclidean space that we *cannot* perceive, was too much to bear for Berkeley. He took the very idea of absolute space to be highly speculative, transcending the available sensory evidence. Similarly, in his short piece *De Motu*, Berkeley argued that certain Newtonian conceptions of the forces of nature also conflict with empiricist sentiments, for they involve the postulation of things like gravity and magnetism that cannot be perceived in any clear sense.

If we keep these various considerations in mind, we find that Newtonianism's philosophical status in the eighteenth century was complex. It is certainly true that (p. 114) Newton's rejection of Cartesian metaphysics and of natural philosophy formed an important component of the emergence of British-style 'experimental' philosophy in the second half of the seventeenth century, a legacy that carried through to the new century as well. But some of Newton's own conceptions within natural philosophy did not always sit well with the canonical authors trumpeting what came to be called British empiricism after Kant. What is clear is that debates about Newtonian ideas formed an essential component of the philosophical conversation of the eighteenth century, long after Newton's death.

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## Notes:

(1) There are numerous biographies of Newton stretching back for roughly two centuries, along with various fictionalized accounts of his life and work. The best account remains the classic biography Westfall 1980.

(2) Foundational scholarship on Newton's work in the alchemical tradition was done by Betty Jo Teeter Dobbs in a number of works, especially Dobbs 1975. For a discussion of more recent work, see Figala 2002 and William Newman's extensive research, which is represented at 'The Chymistry of Isaac Newton' website: <<http://webapp1.dlib.indiana.edu/newton/>>.

(3) In the early modern period, it was common for correspondence between two individuals, and the unpublished manuscripts of one author, to circulate among various intellectual circles. Hence I include correspondence and some of Newton's manuscripts as part of the canon of the 'public Newton'. For instance, manuscripts such as *De gravitatione*, and the famous *De Motu* drafts from 1685, which connect very closely with Newton's published work in the *Principia* and his correspondence with various individuals, would count as part of this canon. But his manuscripts in alchemy and biblical chronology are not continuous with any published works and therefore have a more private status. This is, of course, a rough methodological distinction that bears further thought.

(4) For a very helpful attempt to link what we might call Newton's methodology in his early optical papers to his later methodological work in *Principia*, see Harper and Smith 1995.

(5) The relevant materials, including both Newton's papers in the *Philosophical Transactions* and various authors' responses to them, are helpfully reprinted in Newton 1958: 47–235.

(6) These Cartesian ideas may have been prefigured in the work of Galileo and others, but it is likely that Newton encountered them in depth in Descartes' *Principles*.

(7) Newton's most detailed criticisms of Descartes can be found in his unpublished manuscript *De gravitatione* (Newton 2004: 14–21 especially). Some of these criticisms, especially those that concern space, time, and motion, are also in the Scholium to the definitions that open the *Principia* (*Principia*: 408–15). The original manuscript of *De gravitatione* lacks any dating, and the date of the text's composition remains a subject of considerable scholarly dispute. Whereas some view it as a juvenile work, others see it as a propaedeutic to the *Principia* that could not have been written before the mid-1680s; still others believe it may have been written after the publication of the first edition of the *Principia* in 1687. However, its importance for understanding Newton's philosophical views is not in dispute.

(8) For an extensive and sophisticated understanding of Newton's commitment to what is sometimes called 'philosophical empiricism', see Stein 2002.

(9) For a prominent discussion of some of these issues see Roger Cotes' editor's preface to the second edition of the *Principia*, published in 1713 (*Principia*: 385–99). Not all of the figures who were later identified with the neo-Kantian label *empiricist* embraced Newtonianism. For instance, Berkeley was a fierce critic of some Newtonian ideas—especially the

famous notion of absolute space articulated in the Scholium on space and time in the *Principia*, and also the Newtonian version of the calculus—in the early eighteenth century (Berkeley 1992). But he was sometimes careful to note (especially in *De Motu*) that Newton himself did not fall into the worst metaphysical dead ends of his followers.

(10) In Newton 1962, there is both a transcript of the manuscript of *De gravitatione* and a translation of its Latin into English. The Hall and Hall translation was substantially revised by Christian Johnson and published in Newton 2004.

(11) In fact, he implied that if some thing were not to undergo law-like transfers through space—if its motion were to be entirely haphazard and unconnected to the things that impacted upon it—we might not even consider it to be a body. See Stein 2002 for a helpful discussion.

(12) The unpublished *De gravitatione* sheds light on the Scholium because it presents a very detailed—and to many interpreters, devastating—critique of Descartes' view of body and space, along with the understanding of true motion that he presents in the *Principles*. One of Newton's principal claims is that Descartes' conception of true motion is not compatible with Descartes' own principle of inertia, presented in the first two laws of nature in part two of the *Principles*. Very briefly stated: Descartes' first two laws suggest that whether a given material body is moving must be independent of its relations to other bodies, for a moving body will continue to move unless hindered by some external cause. Yet according to the idea of true motion in the *Principles*, whether a body is truly moving depends upon its relations to its vicinity, and those relations could change—thereby rendering a moving body a stationary one—without any external cause (Newton 2004: 14–16).

(13) For classic discussions of the mechanical philosophy, see Boas 1952 and Westfall 1971. McGuire notes the many meanings of the concept *mechanical* in McGuire (1972: 523n2) and there are many helpful discussions of mechanist views in Wilson 1999, which contains several classic papers. More recent treatments include Bertoloni Meli 2006, Downing 1998, Gabbey 2002, and Garber 2002.

(14) In his capacity as editor of the *Principia*'s second edition, Cotes sent Newton a letter on 18 March 1713 that raised some doubts concerning Newton's application of the third law of motion to 'attractions' (Newton 1959–1977, vol. 5: 392–3). In particular, Cotes contends that we can apply the third law to any interactions between two material bodies that are spatially distant from one another only if we know that they act directly on one another, without any intervening bodies—or intervening material medium—between them. Hence we can apply the third law only to what Cotes calls 'attractions properly so called'. For discussion of this episode, see Janiak 2008: 168–72 and especially Biener and Smeenk 2012.

(15) The first law, of course, expresses a modern formulation of the principle of inertia, a principle that was widely accepted at the time. As we have seen, Descartes had already provided his own formulation of the principle in the form of his first two laws of motion in his *Principles* of 1644.

(16) Some have thought that Newton rejected the mechanical philosophy by arguing that we must construe the question of action at a distance as an empirical one, a question to be resolved by appeal to the latest evidence and, perhaps, the latest physical theory, such as Newton's theory of universal gravity. For an especially compelling articulation of this interpretation, see DiSalle 2006: 13–54. I have presented a rather different interpretation in Janiak 2008.

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## The Reception of Cartesianism

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### Abstract and Keywords

This chapter, which examines the work of Rene Descartes and the reception of Cartesianism in Great Britain in the seventeenth century, suggests that Descartes was an undeniably influential figure during this period, and explains that he exposed the faults of the philosophy before him and pointed the way forward. It also highlights the fact that Cartesianism was accepted in the universities after Aristotelianism was significantly affected by innovations in the sciences and university curricula in natural philosophy had to be changed.

Keywords: Rene Descartes, Cartesianism, Great Britain, seventeenth century, Aristotelianism, university curricula, natural philosophy

It is well known that Enlightenment thinkers tended to dismiss Descartes as a purveyor of ‘romances’, a thinker who sought to explain the world in terms of concepts and notions that he had dreamed up out of his overactive imagination. For Voltaire, Descartes was ‘born to discover the errors of antiquity, and at the same time to substitute his own’. Similarly, Jean Le Rond d’Alembert, writing in the ‘Preliminary Discourse’ to the *Encyclopédie*, that great Enlightenment project, saw him as replacing the errors of Aristotle with errors of his own, misled by the uncertainty and vanity of his own mind. Implicit in these accounts, however, is the view that earlier, in the seventeenth century, Descartes had been an undeniably influential and important figure. One who at least exposed the faults of the philosophy that had gone before him, and who pointed the way forward to what was to come, even if he himself had only a Pisgah view of the true (for Voltaire, d’Alembert, and other contemporaries, the Newtonian) philosophy.<sup>1</sup>

Although it is true that in the preceding age there had been huge and widespread interest in Descartes’ philosophy, even before he published the definitive version of his system in his *Principia philosophiae* of 1644, in Britain at least his contemporaries or near contemporaries were often highly critical of his approach and his conclusions. As early as 1648 the English natural philosopher, William Petty, drew upon a famous Baconian trope to dismiss Descartes. He was as much like (p. 117) the spider as the Scholastics, Petty wrote, ‘employed in spinning the cobwebs out of bare suppositions & out of Principles, which though may be true, yet are remote abstracted & generall’. Similarly, Samuel Parker, writing in 1666, likened Descartes to one of those whom Francis Bacon dismissed as ‘withdrawing themselves from the Contemplation of Nature and the Observations of Experience’, and to ‘have tumbled up and down in their own Speculations and Conceits’.<sup>2</sup> Even Roger North, who became enamoured of Cartesian philosophy during his student days in Cambridge in the 1670s, could dismiss the details of Descartes’ physiology as ‘meer Immechanical fancies’.<sup>3</sup>

This immediately raises the question as to why such an obviously flawed system of philosophy should have attracted so much attention in the first place, much less won so many adherents (as it undoubtedly did in France and the Netherlands, for example).<sup>4</sup> Perhaps it was nothing more than infatuation? Certainly, Christiaan Huygens (surely known as a leading

Cartesian) saw it that way. As he suggested in a reminiscence written towards the end of his life:

M. des Cartes had found the means of getting his conjectures and fictions accepted as truths. And to those who read his Principles of Philosophy much the same happened as to those who read novels that please and create the impression of being true stories. The novelty of the shapes of his little particles and of his vortices were a great attraction. It seemed to me when I read this book of Principles the first time that everything was going well, and I felt when I encountered some difficulty, that it was my fault for not understanding his thought well. I was only fifteen or sixteen. But since then, having from time to time discovered therein some things obviously false, and others highly improbable, I have recovered a great deal from the infatuation I had for it. (Huygens 1905: 403; quoted from Rogers 1985: 291)

If Cartesianism was seductive to seventeenth-century thinkers it was almost certainly because it seemed to offer the only fully worked out system that was capable of replacing the still prevailing scholastic philosophy lock, stock, and barrel. The accumulation of numerous dissatisfactions with the scholastic Aristotelianism which dominated university Arts faculties all over Europe, became increasingly difficult to ignore as Copernican cosmology, embraced by astronomers and championed by Galileo, seemed to call not only for a new cosmology, but also for new theories of motion and causation, matter, form, and space.<sup>5</sup> The trouble was that although Galileo, for example, tried to offer an alternative to the Aristotelian theory of motion, he said nothing about other aspects of Aristotelian theory even though they might be ultimately bound up with Aristotelian ideas on motion. The (p. 118) same was true of other innovators in natural philosophy. It was recognized, therefore, that what was required was a complete system of philosophy, capable of being substituted in the place of Aristotelianism.

Although earlier systems of philosophy had been developed by a handful of individual thinkers, learned opinion seemed to be converging on variants of an atomist revival; albeit variants which amalgamated Lucretian Epicureanism on the one hand with Ficinian notions of seeds (or seminal principles), and on the other with alchemical theories of *minima naturalia*, or minimal particles supposed to be fundamental in what we would call chemical combination.<sup>6</sup> Descartes' own system can be seen as yet another variant in the atomist revival, of course, but his ingenuity and his deliberate and explicit claim to comprehensiveness, set his system apart as the one most likely to offer a successful alternative to Aristotle.<sup>7</sup>

At least, so it must have seemed to those thinkers in France and in the Netherlands who made those two countries the heartlands of Cartesianism. If, however, Descartes failed to make a similar impression in England, and for the most part it seems fair to say that he did fail, it was largely due to prior preoccupations and prior commitments underlying English attempts to discover an alternative to Aristotelianism.

## 5.1 New Philosophies in Britain and the Reaction to Descartes

Perhaps the major factor in England was the commitment to the fact-gathering, experimental methods advocated by Francis Bacon in his never completed, but highly provocative, Great Instauration (the name he gave to his would-be reformed philosophy, intended to take the place of scholastic Aristotelianism).<sup>8</sup> Although Bacon himself never made much progress, his ideas for the reform of natural philosophy were taken up shortly after his death by a number of thinkers, and to (p. 119) some extent put into practice. By the middle of the century, a number of leading natural philosophers, many of whom were later to form the Royal Society, were committed to empirical methods, and ill-disposed towards any speculative philosophies.<sup>9</sup>

Accordingly, one of the members of this Baconian group, William Petty, saw Descartes as no better than any other philosopher who based his system on 'imaginary principles':

I have wearied myself in running through Aristotles, Galens, Campanellas, Helmonts Paracelsus & des Cartes their Imaginary principles, and find much witt & phancy in them all (in some more & some lesse) and have beene highly taken with some of them, especially with those of Des Cartes, but ... I thinke that I better understand

Nature now, than when I puzzled myselfe in their Bookes, although I doe not as yet pretend to have found out Axioms. (Letter from William Petty to Henry More, 1648, Hartlib Papers, VII, 123, quoted from Webster 1969: 368)

For Petty, Descartes would have been better occupied:

in collecting & setting downe in a good order & Method all Luciferous experiments & not bee too buisy in making inferences from them till some volumes of that Nature are compiled, then wee should have a judge of the controversies; and when wee can finde such principles or axioms as will stand with all these experiments, they may as right bee accompted & admitted for such. (Letter from William Petty to Henry More, 1648, Hartlib Papers, VII, 123, quoted from Webster 1969: 368)

Similarly, Robert Boyle, probably the most Baconian of all English philosophers, took exception to Descartes' metaphysical approach to understanding the world system:

For when, for instance, he truly ascribes to God, all the Motion which is found in Matter; and consequently, all the variety of *Phaenomena* that occur in the World; he proves not by an Argument precisely Physical, that God, who is an Immaterial Agent, is the efficient cause of Motion in Matter; ... And when *Des-Cartes* goes to demonstrate, that there is always in the Universe the self-same quantity of Motion ... he proves it, by the Immutability of God, which is not a Physical Argument strictly so call'd, but rather a Metaphysical One. (*Final Causes*, B 11: 91)

Elsewhere, he insisted that systems of natural philosophy should be grounded upon experiment, not theory:

That then that I wish for, as to Systems, is this, That men in the first place would forbear to establish any Theory, till they have consulted with (though not a fully competent number of Experiments, such as may afford them all the Phaenomena to be explicated by that Theory, (p. 120) yet) a considerable number of Experiments, in proportion to the comprehensiveness of the Theory to be erected on them. (*Certain Physiological Essays*, B 2: 14)

Final confirmation that Cartesianism never surmounted such Baconian hurdles, and was never fully accepted in England, can be seen in the fact that the leading lights of the Royal Society always professed themselves to be pursuing a Baconian programme of experimental philosophy, and compared the Society to 'Salomon's House', the institution devoted to the advancement of natural knowledge which Bacon had imagined in his utopian *New Atlantis* (1627). In this regard, the Royal Society can be usefully compared with its French equivalent, the Parisian Académie des Sciences. Although the Académie was never in any sense an officially Cartesian institution, and indeed its members also invoked Salomon's House as their exemplar, the vast majority of the academicians in its early decades were either self-professed Cartesians, or effectively subscribed to Cartesian precepts.<sup>10</sup>

Although the Royal Society was far more Baconian than the French Académie, it might be suspected nevertheless that whatever the fellows of the Royal Society might have said about their Baconian ethos, they were in practice all mechanical philosophers. It might be supposed, therefore, that there was in fact some deep-seated Cartesian influence at work. Certainly, the leading lights of the Royal Society, and other natural philosophers, such as Henry Power, all embraced the major precepts of the mechanical philosophy. This meant that they tended to accept a new theory of causation, and new assumptions about explanation, in which all physical phenomena were ultimately seen as aspects of machine-like interaction, involving contact actions between moving parts which transferred motions to other parts of the system, leading to further mechanical interactions.<sup>11</sup>

Given the investment by British thinkers in the mechanical philosophy, it is impossible to deny Cartesian influence outright, but it is important to point out that Cartesianism was only one of several philosophies contributing to the rather unique blend which constituted British mechanical philosophy. Whatever Cartesian influence there might have been, the mechanical philosophy in England could never be said to have been straightforwardly, much less exclusively, Cartesian.

There were, after all, natural philosophers in England who were already involved in trying to develop quasi-atomistic, or even what Isaac Beeckman in the Netherlands was calling physico-mathematical, systems of natural philosophy long before they could have known about Descartes.<sup>12</sup> Beeckman is now chiefly remembered as the man who introduced Descartes to physico-mathematical ways of explaining (p. 121) natural phenomena, but he was evidently not the only thinker to interpret the newly revived ancient atomistic theories in this light.<sup>13</sup> In England, three thinkers who had won the patronage of the so-called ‘wizard Earl’, Henry Percy, ninth Earl of Northumberland, were thinking along similar lines in the early decades of the seventeenth century. These were Thomas Harriot, Walter Warner, and Robert Payne (see Kargon 1966 and Jacquot 1974). Warner and Payne subsequently worked for the Cavendish brothers (William, first duke of Newcastle, and Sir Charles Cavendish), and seem to have been instrumental in starting Thomas Hobbes on the road towards developing his own mechanical philosophy.<sup>14</sup> Certainly, Hobbes cannot be seen merely as someone who jumped on the Cartesian bandwagon when it rolled by. Hobbes, like Descartes, saw the potential for explaining all physical phenomena exclusively in terms of matter in motion, but this does not mean he took the idea from Descartes. The chronology suggests that each of them was independently inspired by the kinematic physics (that is, a physics based exclusively on bodies in motion and where the only ‘forces’ allowed were forces of impact) which Galileo had partially developed in his *Dialogue on the Two Chief World Systems* (1632), and his *Discourses on Two New Sciences* (1638). The evidence suggests that as their systems developed over time, Hobbes took more from Descartes than Descartes ever did from Hobbes, but even so, Hobbes could never be said to have become tantamount to a Cartesian (Sorell 1995).

Similarly, the system of atomist, or at least corpuscular, mechanical philosophy developed by the English Roman Catholics, Thomas White, and Sir Kenelm Digby, seems to have had its origins in dovetailing the atomist revival with the corpuscular matter theory of alchemy (at which Digby was an adept), and other emerging ideas of physico-mathematics. As with Hobbes, there is evidence to suggest that Digby and White were not above taking ideas from Descartes to lend support and plausibility to their own system, but for all that their system was never simply Cartesian.<sup>15</sup>

Robert Boyle, likewise, was developing his own system of ‘new philosophy’, inspired on the one hand by his own fascination with alchemy, and by the alchemical theories of Daniel Sennert and Joan Baptista van Helmont, and on the other by his involvement with Samuel Hartlib and his circle and their shared enthusiasm for what they saw as Baconian projects.<sup>16</sup> In line with his self-professed Baconianism, Boyle even claimed that his own philosophy was free from any theoretical preconceptions and based solely on experimentally or observationally (p. 122) revealed facts. In *Certain Physiological Essays* of 1661, he wrote that he ‘purposely refrained ... from seriously and orderly reading’ either Gassendi’s *Syntagma* or Descartes’ *Principles* (B 2: 12). There has been a tendency among historians of science to view this claim with scepticism, and to assume it was merely a rhetorical way of laying claim to Baconian credentials. It is known, however, that Boyle was unable to follow Descartes when he first read him, and that it was his assistant Robert Hooke, later to become one of England’s greatest experimental philosophers, who ‘made him understand Descartes’ Philosophy’ (Aubrey 2000: 395; Davis 1994: 159–60). Since Hooke first met Boyle in 1658 it is perfectly feasible that Boyle had not read, or at least had not understood Descartes when he was writing his *Certain Physiological Essays*. Although Boyle undoubtedly borrowed from Descartes after tuition from Hooke, he did so only in a general way, and borrowed just as much, if not more, from the revived Epicurean atomism expounded by Pierre Gassendi, and even more from the chemical corpuscularism of contemporary alchemy.<sup>17</sup>

Gassendi’s system was primarily introduced to English readers by the physician and anatomist, Walter Charleton. Judging from the trajectory suggested in his publications Charleton, like Boyle, initially saw Helmontian alchemy as the most promising key for understanding the physical world, and the starting point for his own version of the new philosophy. In his *Darknes of Atheism dispelled by the Light of Nature* of 1652, however, the influence of Descartes is clearly dominant (taking as its starting point systematic doubt supplanted by a distinctly Cartesian version of the ontological argument). But by the time he came to write his major work, two years later, the title announced his new allegiance to Gassendi’s Epicureanism rather than Descartes’ more original philosophy: *Physiologia Epicuro-Gassendo-Charltoniana*.<sup>18</sup>

In developing their own versions of the mechanical philosophy, all British natural philosophers, from Harriot to Newton,



developed a theory of matter based on the assumption of invisibly small particles ('atoms', for those insisting on ultimate indivisibility; 'corpuscles' for those who allowed infinite divisibility in principle, and for those who wished to remain non-committal) (Kargon 1966). Here again, it is impossible to deny some Cartesian influence, but clearly unwise to see Descartes as the sole influence. As we noted earlier, the atomist revival had been in train since the sixteenth century and involved a number of disparate elements, including corpuscular alchemical theories and other occult notions of seeds and seminal principles. Descartes' corpuscular matter theory almost certainly played the major role in showing his contemporaries how such a theory worked, and how it could be invoked, as Descartes himself claimed, to explain all physical (p. 123) phenomena. The scope and power of the Cartesian system, and its easy intelligibility, could hardly fail to make a huge impression on educated consciousness.

While the dominant influence of Descartes upon educated opinion cannot be denied (for example, we will consider his influence upon university students below), it was not really the same story among the leading natural philosophers. Like Huygens, committed natural philosophers saw too many 'things obviously false, and others highly improbable', and too many lacunae (Descartes paid no attention to chemical phenomena), to fully endorse his matter theory. Certainly, Descartes' three 'elements'—his three sizes of corpuscle (the smallest to fill in every conceivable space between the other two kinds of particle to guarantee a plenum, the largest said to constitute all bodies)—did not figure in any British version of the mechanical philosophy.<sup>19</sup> Moreover, British philosophers seem to have found it impossible to agree with Descartes that body could be characterized solely in terms of extension. Resistance or impenetrability was generally regarded as an essential characteristic of matter. Similarly, with the exception of Hobbes, natural philosophers in Britain preferred the ancient prescription of atoms and the void to the Cartesian plenum. A general belief not just in the possibility of void space but in its reality (at least at the level of invisibly small inter-particulate vacua) reinforced the anti-Cartesian opinion that extension alone could not define body (Gabbey et al. 1998).

Of the thinkers mentioned so far, only Hobbes took the trouble to develop explicit objections to Descartes' philosophy. Unfortunately the fifty-six-page letter he wrote to Marin Mersenne in 1640, objecting to Descartes' *Discourse on the Method* (1637) has been lost. It is surely significant, however, that his objections included, along with those of other thinkers, in Descartes' *Meditations on First Philosophy* (1641) fail to really engage with Descartes' own philosophy—being far more concerned to promote his own materialist system of philosophy (see Sorell 1995 and Curley 1995).

Isaac Newton was always explicit in rejecting and even refuting Cartesianism, both in private and in his publications. Writing as a young man in a private notebook, he pointed out that if Descartes was right, 'We should see a bright light above us, because we are pressed downward'; and that 'A man goeing or running would see in the night' (because vision is supposed to be caused by streams of particles hitting the eye). In a section headed 'Of the Celestiall matter & orbes', he expressed his doubts merely as queries: 'Whether Descartes' his first element can turn about the vortex and yet drive the matter of it continually from the Sun to produce light' (McGuire and Tamny 1983: 355).

The influential 'General Scholium', which Newton added to the second edition of the *Principia* in 1713, was explicit in its rejection of Cartesianism. It opens, for (p. 124) example, by pointing out that 'The hypothesis of vortices is beset by many difficulties', including the fact that the axial rotations of the planets and the Sun would all have to be the same, and that the observed motion of comets 'cannot happen unless vortices are eliminated' (*Principia*: 939).

Another explicit and very prominent critic of Cartesianism was, of course, John Locke. Before embarking upon his own account of the way the human mind works, which he deferred to Book Two of his *Essay*, Locke dedicated the whole first Book to a protracted and detailed refutation of innate principles and ideas. For most contemporaries this would have been seen chiefly as a dismissal of Cartesian notions (Voltaire 1733: Letter XIII). It seems clear from this fact alone that Descartes was certainly a force to be reckoned with, even among English readers. Indeed, as we shall see later, the 1690s were effectively the high-water mark of Cartesian influence in Britain. By this time, in spite of unceasing opposition, Cartesianism had come to dominate the natural philosophy curricula in the universities. Its dominance was not destined to last, however, as Newton's *Principia* had already appeared on the scene—although not yet understood. Publishing in the

1690s, however, Locke had little choice but to dismiss the well-known view of the mind which was completely incompatible with his own view. Even so, for those well disposed towards Descartes, Locke's *Essay* could be seen as 'another tree sprang from a Cartesian root', or as having 'taken all that was good in it from Des Cartes'.<sup>20</sup>

What these critics had in mind, presumably, were the undeniably Cartesian origins of Locke's 'new way of ideas'. Descartes had effectively established the new philosophical concept of 'idea' by adapting earlier scholastic usages in which ideas were either images of things in the imagination, or were exemplars of things in the mind of God which God made real in the Creation (the latter was based on the Platonic notion of idea). By combining these the way he did, Descartes was able to suggest that ideas were psychological entities which were not dependent on sensation (God's exemplars or archetypes were not derived from sensation), and thus were not images in the imagination (which he saw as essentially corporeal) but mental entities in the intellect, having their own existence. In a letter of 1641 Descartes wrote that 'by the term "idea" I mean in general everything which is in our mind when we conceive something, no matter how we conceive it' (Ariew and Grene 1995: 88; cf. Ayers 1998).

Descartes' new use of this term proved highly influential and became a prominent feature of philosophizing in the later seventeenth century. For John Locke, writing at the end of the century, the word 'idea' was:

(p. 125) that Term which, I think, serves best to stand for whatsoever is the Object of the Understanding when a Man thinks, I have used it to express whatever is meant by *Phantasm*, *Notion*, *Species*, or whatever it is, which the Mind can be employ'd about in thinking. (*Essay* I. i. 8)<sup>21</sup>

Although Edward Stillingfleet was unhappy that Locke's 'new way of ideas' had been used 'to promote scepticism and infidelity', he had clearly absorbed (perhaps unwittingly) the new usage of 'idea', regarding it as simply a new label for the 'common notions of things which we must make use of in our reasonings' (quoted from Chappell 1994: 26).

Between Descartes and Locke there was, of course, a continuous historical development of the new Cartesian usage. It seems fair to say, however, that most developments took place among continental philosophers. Locke's *Essay concerning Human Understanding* effectively introduced the 'new way of ideas' into British philosophy, but by then Locke had had time to develop his own concept of ideas, their nature and their origins. Locke differed from Descartes not only with regard to innate ideas (a category he dismissed outright), but also with regard to the so-called 'veil of perception'—the notion that we have direct access only to our ideas, from which we have to infer the existence of a world external to us (this was the source of the scepticism and infidelity that worried Stillingfleet).

Ironically, Locke's own influence on subsequent philosophy has been so great that the 'veil of perception' account of cognition has been read back into Descartes' own theory of ideas. Current understandings of Descartes reject this view, however, and suggest that Descartes wanted to maintain a belief in our direct perception of the world (Pessin 2009 and Ayers 1998). Accordingly, we can see that once again, although Descartes provided the starting point for the 'way of ideas', the way itself, at least in Britain, soon diverged from Descartes' own path.

It seems perfectly clear, therefore, that although Descartes' philosophy was well known, and even acknowledged to be one of the most powerful of the new systems of philosophy which were proposed at that time, it failed to win any fully committed adherents among leading natural philosophers in the British Isles. Certainly, there were no English equivalents of Claude Clerselier or Jacques Rohault, both of whom have been described as 'dedicated to spreading the pure gospel of Descartes' philosophy'. But nor were there any equivalents of Huygens or Nicolas Malebranche—both of whom can be seen as starting out from Cartesianism and turning it into distinctive philosophies of their own.<sup>22</sup> If there was an exception to this rule, it was Antoine Le Grand, a Franciscan friar who was born in the Spanish Netherlands and who had entered the English province of the Catholic seminary at Douai in 1647. Le Grand was sent to London in 1656 to teach philosophy to the sons of English Roman Catholic gentry. In 1671 he published a textbook which presented (p. 126) Descartes' philosophy in a way which would have been familiar to those trained in scholastic philosophy. Favourably received, particularly at Cambridge, the book was immediately expanded by Le Grand into his *Institutio philosophiae secundum principia Renati Descartes ...*

*ad usum juventutis academicae (Institution of philosophy according to the principles of René Descartes ... for the use of the youths of the academies, 1672).*

Leaving Le Grand aside, if we confine ourselves to British thinkers it remains true to say that although Cartesianism contributed to the distinctive systems developed by English natural philosophers, such as Hobbes, Digby, Boyle, Henry Power, and Robert Hooke, it did so only as one ingredient among several, and cannot be said to have chiefly constituted the original starting point for their philosophies.

It would seem, then, that although Cartesianism was embraced in France and the Netherlands as the best alternative to Aristotelianism, on the other side of the English Channel, where natural philosophers were more accustomed to Baconian ways of thinking, Cartesianism was harder to accept. English thinkers evidently found it easier than continental thinkers to notice those factors which Huygens called ‘obviously false’ or ‘highly improbable’. The result, therefore, was a certain amount of cherry-picking from Cartesian philosophy, but nothing that looked anything like full-blown Cartesianism among leading English thinkers. The importance of Descartes’ rules of collision was certainly recognized by British mechanical philosophers, especially those who were more mathematically minded, and even after his rules were exposed as false by Fellows of the Royal Society, including Christopher Wren and John Wallis, the Fellows continued to believe that collisions could be analysed and understood in this fundamentally Cartesian way (see Steinle 2008: 221–2). The Cartesian notion of clear and distinct ideas was appropriated for its own use by the tolerationist thinker Richard Burthogge, the Anglican natural theologian Edward Stillingfleet, and others.<sup>23</sup> Descartes’ optical theory, especially his view that it is the mind which sees, was highly influential and the starting point for virtually all discussions of the topic.<sup>24</sup>

Similarly, there are numerous echoes of Cartesian cosmology in British natural philosophy. The phrase ‘our vortex’ was occasionally used up into the 1690s the way we would use ‘our solar system’.<sup>25</sup> The new genre of cosmogonical writing which Descartes inspired in the Netherlands and in France was mimicked in Britain, and can be seen in the writings of Henry More, Stillingfleet, and others.<sup>26</sup> (p. 127) Thomas Burnet exploited Descartes’ theory of the formation of the Earth, when he developed his own *Sacred Theory of the Earth (Telluris theoria sacra)*. Burnet noticed that the details of Descartes’ proposed geomorphology allowed a ready explanation of the cryptic comment in Genesis that Noah’s flood occurred when ‘all the fountains of the great deep [were] broken up’ (Gen. 7: 11). Although Descartes provided the starting point, however, Burnet’s theory was by no means entirely in keeping with Cartesian precepts (see Roger 1982 and Harrison 2000). Moreover, this Cartesian enterprise was not without its critics. The religious controversialist John Edwards dismissed the ‘Romantick’ Cartesian ‘world of Whirlpools’, while the Newtonian John Keill pointed to Burnet’s reliance on Cartesianism as the chief flaw in his cosmogony (cited in Harrison 2000: 177).

Cartesian physiology also made an impression on British thought. It is all too often suggested that the Cartesian notion of the *bête machine* was rejected in England, but this seems to be grounded on nothing more secure than the stereotype of the animal-loving English. In fact, this is one aspect of Descartes’ philosophy which can be seen to have won adherents in Britain. The reasons for this were chiefly theological, rather than philosophical. Those English thinkers who embraced the Cartesian view did so not because they rejected the notion of an animal soul, as Descartes did, on philosophical grounds; but because they neither wanted to accept the possibility of animals having an afterlife and living eternally in heaven, nor to accept that innocent animals were simply born to suffer. If animals were automata, they could not suffer (Harrison 1993: 525–31).

It seems fair to say that mechanistic attempts to explain the workings of animal and human bodies, based generally speaking on imagined (and rather vague) hydraulic systems, were initially inspired by Descartes. This was an aspect of the new philosophies of the seventeenth century that had no precursors before Descartes, and marked one of his most original contributions to early modern thought.<sup>27</sup> Even here, however, British thinkers did not simply follow Descartes. The main stumbling block was the Cartesian account of the heart (prominent in the *Discourse on the Method* as well as in the *Traité de l’homme*). Although explicitly based on William Harvey’s account in *De motu cordis (On the Motion of the Heart, 1628)* and assuming, therefore, the circulation of the blood, Descartes could never accept the unexplained pulsific faculty of

the heart in Harvey's account. Descartes' ingenious mechanistic account, however, rejected Harvey's claims that the contraction or *systole* of the heart was its active stroke (squeezing blood from the left ventricle into the aorta and arterial system), and required the expansion or *diastole* of the heart to be the active stroke (an explosive inflation of the left ventricle, ejecting blood into the aorta). Harvey's empirical evidence in favour of systole as the active stroke was so unassailable that Descartes tried to insist that what Harvey (p. 128) was assuming to be systole was in fact diastole (thereby making all Harvey's evidence prove diastole was the active stroke), but nobody in Britain was fooled by this (see Anstey 2000b). Perhaps as a result of having had their suspicions aroused by Descartes' convenient reinterpretation of Harvey's work, mechanistic physiologists in Britain developed their own non-Cartesian physiologies. For example, the Cartesian account of muscle contraction, as the result of inflation by an influx of animal spirits (as the muscle's girth increased the ends of the muscles were drawn closer to one another), was rejected in the face of a number of rival, usually chemically inspired, alternatives.<sup>28</sup>

In spite of Descartes' British critics, however, and the lack of any British natural philosophers who could be said to have been authentically Cartesian, it seems clear that Cartesianism made an undeniable impression on British thought. The foregoing examples of borrowings, appropriations, and initial inspirations from Descartes' philosophy could certainly be multiplied to make a long and wide-ranging list.<sup>29</sup>

So far we have been considering the reactions of natural philosophers to Descartes. There were others, of course, who were much more dead-set against Descartes, and indeed, any of the new philosophies. The main point at issue for these thinkers was that Descartes effectively dismissed the relevance of erudition. For Descartes, they complained, it was only necessary to seek for answers to any problems arising in the principles of the mechanical philosophy. A life spent dedicated to book-learning could avail the enquirer nothing worthwhile.

For these scholarly thinkers, what they saw as the simplistic approach of the new philosophies was such an affront to their learned and bookish attitudes that they did not stop at condemning it merely as another form of philistinism. Descartes' philosophy was seen as absurdly solipsistic, and Descartes himself, therefore, came to be seen as simply mad. Meric Casaubon, the son of the great humanist scholar Isaac Casaubon who had moved to England in 1610, stated it most forcefully:

But for his *Method*: I tooke him for one, whom excessive pride and self-conceit (which doth happen unto many) had absolutely bereaved of his witts. I could not beleeeve that such stuffe, soe ridiculous, soe blasphemous (as I apprehended it, and doe still) could proceed from a sober man. A cracked brain man, an Enthusiast, ... I tooke him to be. ('On Learning' [1667], in Spiller 1980: 203)

Casaubon went on to compare Descartes with Gassendi, who, although he made the mistake (as Casaubon saw it) of trying to present the 'detestable monster' Epicurus as 'an excellent Philosopher', showed himself by his classical scholarship to be 'the most accomplished Generall scholar we have had of late' ('On Learning' [1667], in Spiller 1980: 203–4). Similarly, in his *Tale of a Tub*, Jonathan Swift included Descartes among those thinkers who he believed 'if they were now in (p. 129) the world' would be in 'manifest Danger of *Phlebotomy*, and *Whips*, and *Chains*, and *dark Chambers*, and *Straw*' (Swift 1920: 166).<sup>30</sup>

The full background to these responses to Descartes is to be found in the ongoing debate between 'Ancients' and 'Moderns'—that is to say, the dispute in late seventeenth-century England as to whether the Ancients and their methods were superior to anything produced since, or whether modern thinkers had superseded the Ancients.<sup>31</sup> There can be little doubt, however, that Descartes' explicit and uncompromising rejection of everything that had gone before, effectively proclaiming himself, as Casaubon said, 'the Oracle of the world', was a major factor in the rejection of the new philosophies by the old guard.<sup>32</sup>

It would seem, then, that neither leading natural philosophers, nor those who defended the values of traditional learning and scholarship were persuaded that Descartes had discovered the correct method for philosophy, much less the true philosophy itself. The points of contention were not all confined to philosophy, however. Another crucially important factor in the British

rejection of Descartes was the perceived dangers that his philosophy presented to religious belief.

## 5.2 Religious Responses to Cartesianism in Britain

As early as 1654, Robert Baillie, Professor of Divinity at Glasgow, wrote to Gisbert Voetius, Professor of Theology at Utrecht and a man waging his own war against Cartesianism, of the interest among the students in the ‘fatuous heretic Descartes’ and his new philosophy (Laing 1841–1842, 3: 268).<sup>33</sup> It seems clear, however, that the association between Cartesianism and irreligion really began to be a prominent issue from the end of the 1660s. For example, it was around this time that the Cambridge theologian, Henry More, leading member of the so-called Cambridge Platonists, who had welcomed Cartesianism with open arms in the late 1640s, and had even introduced it into his teaching at Cambridge, now came to believe that he had made a dreadful mistake.

Initially seeing Descartes as a fellow dualist who shared his eagerness to disarm and dispel the materialism and atheism of the age, More waxed lyrical about (p. 130) Descartes in his early publications. In his *Defence of the Threefold Cabbala* of 1653, for example, he declared that he looked upon Descartes:

as a man more truly *inspired* in the knowledge of Nature, than any that have professed themselves so these sixteen hundred years; and being even ravished with admiration of his transcendent *Mechanical* inventions, for the salving the *Phaenomena* in the world, I should not stick to compare him with *Bezaliel* and *Aholiab* those skillful and cunning workers of the Tabernacle, who, as *Moses* testifies, were filled with the Spirit of God, and they were of an excellent understanding to find out all manner of curious works. (More, *Defence of the Threefold Cabbala* [1653], quoted from More 1662: 104)

It is clear, however, even from More’s correspondence with Descartes in 1648 and 1649 that More was never a fully-fledged Cartesian. In his letters More is effectively pointing out those aspects of Descartes’ philosophy which he sees as endangering the overall aim to defeat materialism. In so doing, of course, he exposed the real differences between them, even if at that time he failed to see that they were real differences (presumably, he expected Descartes to see where he had slipped up in his *Principia* and to adjust his arguments in future). Seeking to convince Descartes of the truth of his own concept of infinite absolute space, for example, More rejected on the one hand Descartes’ distinction between a universe which is indefinite in extent and one which can be concluded to be infinite, and on the other hand his definition of body as extension, and the concomitant impossibility of void space. Another group of criticisms derived from More’s dissatisfaction with Descartes’ version of mind–body dualism, including aspects of the union and interaction of body and soul, the denial of souls in animals, and major differences about what can be achieved by matter in motion, and what for More requires a more active (and therefore immaterial or spiritual) principle (see Gabbey 1982 and Crocker 2003).

Descartes’ death in 1650 curtailed the correspondence and perhaps allowed More to go on thinking for years after that Descartes and he were fundamentally of like minds. By 1671, however, in a letter to Boyle, More admitted how embarrassed he now was by his association with Descartes:

It had been to the prejudice of religion, and to my great reproach, for me, who have been, from my youth to this very day, so open a stickler for the support of natural religion, and for Christianity itself, in the best mode thereof, to be found of so little judgment, as not to discern, how prejudicial *Des Cartes*’s mechanical pretensions are to the belief of a God. (Boyle 2001, 4: 232)

In spite of his own reputation, More feared, he was ‘accounted amongst the wits, one of their gang; and a perfect Cartesian ... and, indeed, no less than an infidel and atheist’.

I was informed out of Holland, [he went on,] from a learned hand there, that a considerable company of men appeared there, mere scoffers at religion, and atheistical, that professed (p. 131) themselves Cartesians: and that



his philosophy may naturally have such an influence as this, I can neither deny, nor could conceal. (Boyle 2001, 4: 231–2)

Seeking to defend the new philosophy in general from the taint of atheism, Robert Boyle defended Descartes, but in so doing even he had to acknowledge the problem—that Descartes' system was so comprehensive in its coverage that it was easy to forget the role of God.

For though I have often wish'd, [Boyle wrote,] that Learned Gentleman had ascrib'd to the Divine Author of Nature a more particular and immediate efficiency and guidance in contriving the parts of the Universal Matter into that great Engine we call the *World*; and though I am still of Opinion, that he might have ascrib'd more than he has to the Supreme Cause, in the *first* Origine and Production of things Corporeal ... I do not profess myself to be of the Cartesian [sect]: yet I cannot but have too much value for so great a wit as the founder of it, and too good an opinion of his sincerity in asserting the existence of a Deity, to approve so severe a Censure as the Doctor [i.e. More] is pleased to give of him. (*Hydrostatical Discourse* (1672), B 7: 142)

Although the Cartesian system required God as the Creator and to give an initial push to set things in motion, after that the running of the system could be explained without recourse to the deity. Many in the generation after Descartes, believers and sceptics alike, saw this as tantamount to atheism. It was an easy step from Descartes' theistic cosmogony to the supposition that the world had always existed and had never needed a starting push from a supreme being. Atheism being a capital offence, it is difficult to find direct evidence of the existence of Cartesian atheists, but given the genuine concern of orthodox thinkers about them, it seems safe to assume that they really did constitute a significant presence throughout late seventeenth-century Europe (Wootton 1988; Hunter 1990: 437–60).

One exacerbating factor in the transformation of Cartesianism into an atheistic philosophy, at least in the eyes of the faithful, was Descartes' exclusion of so-called 'final causes' from his natural philosophy. The final cause of a thing was its purpose, its *raison d'être*, and in the Christian tradition these were usually referred back to God and his supposed intentions.

Descartes explicitly rejected recourse to final causes in both the *Meditations* and the *Principia philosophiae*. Ostensibly, his reason for doing so was a theological one—namely that we cannot (and should not arrogantly presume to) know God's purposes.<sup>34</sup> We should neither underestimate the power of God, nor overestimate our own worth by assuming God did everything for our benefit. God's purposes can never be fully known to mankind, Descartes insisted, and accordingly, 'the kind of cause known as final is useless in physical things'.<sup>35</sup> Be that as it may, it is hard to (p. 132) resist the conclusion that Descartes' own purposes were not so much theological as natural philosophical, and that by removing final causes from discussion he was freer to discuss everything merely in terms of efficient causes.

Although Henry More had long failed to note the potential for atheism in this Cartesian manoeuvre, by 1668, when he came to write his first thoroughly anti-Cartesian work, his *Divine Dialogues*, he was in no doubt:

A third peculiar property of his Philosophy is, a seeming Modesty in declining all search into Final causes of the *Phaenomena* of the World: as if, forsooth, that were too great a presumption of humane wit, to pry into the ends of God's Creation; whenas indeed his Philosophy is of that nature, that prevents all such Researches; things coming to pass, according to it, as if God were not at all the Creatour and Contriver of the World, but that mere Matter Mechanically swung about by such a measure of Motion fell necessarily, without any more to doe, into this Frame of things we see, and could have been no otherwise then they are; and that therefore all the particular Usefulnesses of the Creation are not the Results of Wisdome or Counsel, but the blinde issues of mere Material and Mechanicall Necessity. (More 1668: sig. a1<sup>r-v</sup>)

Robert Boyle also saw the danger here and went so far as to publish a book-length defence of the concept of final causes: *A Disquisition about the Final Causes of Natural Things*. Although not published until 1688, this is known to have existed in draft form at least since 1677 (Davis 1994: 157; cf. Shanahan 1994). We can be in no doubt that he saw Cartesians as the

chief threat in this regard:

And I confess, I somewhat wonder, that the *Cartesians*, who have generally, and some of them skillfully, maintain'd the Existence of a Deity, should endeavour to make Men throw away an Argument, which the Experience of all Ages shews to have been the most Successful, (and in some Cases the only prevalent one) to establish among Philosophers the Belief and Veneration of God. (B 11: 94)

The perceived Cartesian rejection of final causes was still an issue for Isaac Newton in 1716, when he was drafting additions to the *Queries* at the end of the *Opticks*:

An Atheist will allow that there is a Being absolutely powerful necessarily existing & the author of mankind and calls it Nature ... And he may tell you further that the Author of mankind was destitute of wisdom & designe because there are no final causes & that matter is space and therefore necessarily existing & having the same quantity of motion would in infinite time run through all variety of forms one of which is that of a man. (Cambridge University MS Add. 3970.9 f. 619)

Unlike More, Newton seems to have noted the threat to religion posed by Cartesianism from very early in his acquaintance with Descartes' writings. A.R. Hall and M. Boas Hall, in their edition of some of Newton's unpublished papers, noted that in his earliest papers in mechanics Newton is driven to make a point by point refutation of Descartes' physics (Hall and Hall 1962: 76). It is surely highly significant, therefore, that one of these early works in mechanics, the *De (p. 133) gravitatione et aequipondio fluidorum*, written sometime after 1668, soon shifts away from mechanics towards natural theology.<sup>36</sup>

Newton's opening definitions in *De gravitatione* are thoroughly opposed to Descartes' precepts and Newton accordingly declares his intention 'to dispose of his fictions' (Hall and Hall 1962: 123; cf. Newton 2004: 14). There follow a series of arguments intended to show the inconsistencies arising from Descartes' conception of motion. Eventually, however, he comes around to the concept of matter and extension. No sooner does Newton announce his intention to examine Descartes' concept of extension than he introduces God into the discussion:

For since the distinction of substances into thinking and extended, or rather, into thoughts and extensions, is the principal foundation of Cartesian philosophy ... I consider it most important to overthrow [that philosophy] as regards extension, in order to lay truer foundations of the mechanical sciences.

Extension, Newton declares, is neither substance nor accident but an 'emanative effect of God' (Hall and Hall 1962: 131–2; Newton 2004: 21).

Remarkably, Newton goes on to develop a theory of body in which parts of this space are made impenetrable merely by God's willing it so (Hall and Hall 1962: 138–9; Newton 2004: 28). Strange as this may seem, its advantages (at least from Newton's point of view) are soon made apparent:

the usefulness of the idea of body that I have described is brought about by the fact that it clearly involves the chief truths of metaphysics and thoroughly confirms and explains them. For we cannot postulate bodies of this kind without at the same time supposing that God exists, and has created bodies in empty space out of nothing ... Say, if you can, which of the views, already well known, elucidates any one of these truths or rather is not opposed to all of them. If we say with Descartes that extension is body, do we not manifestly offer a path to Atheism, both because extension is not created but has existed eternally, and because we have an absolute idea of it without any relationship to God, and so in some circumstances it would be possible for us to conceive of extension while imagining the non-existence of God? (Hall and Hall 1962: 142–3; Newton 2004: 31)<sup>37</sup>

It seems fairly clear that the report of Newton's mathematician friend, John Craig, was perfectly true: Newton showed 'the errors of Cartes' Philosophy ... because he thought it was made on purpose to be the foundations of infidelity' (Cambridge University Library, Keynes MS 130.7, f. 1<sup>r</sup>).



(p. 134) For those whose fears about the consequences of unorthodoxy in religion were political rather than philosophical, it was Descartes' Roman Catholicism that was the major stumbling block. Evidence suggests that a significant number of English thinkers suspected his philosophy was developed merely as one part of a Catholic conspiracy to bamboozle students and others, with a view to re-establishing Catholicism in Britain. This early modern conspiracy theory evidently derived from comments in Tommaso Campanella's *De monarchia hispaniae*, which had been reprinted in Amsterdam in 1653, that natural science should be encouraged in Protestant territories to distract the best minds and so make it easier for counter-reforming priests to bring the majority of the populace back to the Roman Church (Campanella 1653: 64–5, 236–7). Deliberately fomented by the controversialist Henry Stubbe in an attack on the Royal Society, entitled *Campanella Reviv'd* (1670), Cartesianism, along with all other promoters of the new philosophy, soon came to be seen as part of the same conspiracy.

In 1675, for example, Thomas Barlow, Bishop of Lincoln, received a letter from Sir J.B. (possibly the king's physician, John Baber) repeating the Campanella story and pointing out that:

Papists (especially the Jesuites) have promoted this *New-Philosophy* (and their new design to ruine us by it;) for the great Writers and Promoters of it are of the Roman Religion: (such as *Des Cartes*, *Gassendus*, *Du Hamel*, *Maurus*, *Mersennus*, *De Mellos*, etc.) and what divisions this new Philosophy has caused amongst Protestants in *Holland* and *England*, cannot be unknown to any considering person. (Barlow 1693: 158)

For Meric Casaubon also, Descartes' method was obviously a form of what, in the twentieth-century 'Cold War', would be called 'brain-washing'. According to Casaubon, Descartes operated like a 'Jesuited Puritan', so that:

After he hath obliged his disciples to forgett and forgoe all former praecognitions and progresses of eyther senses or sciences, then he thinks he hath them sure: they must adheare to him tooth and nayle ... God help them that have no better grounds to build the soules immortalitie, or the existence of an Omnipotent Deitie, upon. (Spiller 1980: 205)

One important aspect of Cartesianism which did win adherents in Britain, however, was occasionalism. Although never discussed, much less developed, by Descartes himself, the later Cartesian notion that the only efficient cause operating in the world was God proved irresistible to some of those who wished to use natural philosophy to combat atheism. Given the role of so-called laws of nature in Cartesian explanation, and the obvious fact that inanimate objects cannot 'obey' laws, it was inevitable that God's role in physical causation should be re-examined by Descartes' followers. Louis de la Forge and Géraud de Cordemoy set the ball rolling but the most fully developed occasionalist philosophy was presented by Nicolas Malebranche.<sup>38</sup>

(p. 135) For a brief period there was a Malebranchian occasionalist movement in Britain. Initiated in the late 1680s by John Norris, an Anglican clergyman who had previously been influenced by the Cambridge Platonist Henry More, and taken up by Thomas Taylor, who translated Malebranche into English, and Arthur Collier, who developed an immaterialist philosophy, the movement failed to survive the criticisms of John Locke and was also undermined by the success of Newtonianism (in which bodies were invested with their own causal powers) (but see McCracken 1983).

Even long before this, however, Robert Boyle had paid serious attention to occasionalism. There is an unpublished defence 'of the new Paradox of some Cartesians' that 'God himself is the only proper and immediate cause' written by Boyle sometime in the late 1670s or early 1680s. Although this short unfinished tract seems to uphold occasionalism, the clear implication of Boyle's published works is that he believed in the causal efficacy of bodies themselves. It is possible, therefore, that at the time Boyle wrote this piece he saw occasionalism as a viable natural philosophy with the clear advantage that it made atheism untenable (always an important consideration for Boyle). The fact that he never published it, and never developed these ideas anywhere else, suggests that in the end he changed his mind—possibly because of the untenable implication that God is directly responsible for all evil, and that human free will is illusory. Be that as it may, it is clear that Boyle did not become an English Malebranche. Once again, it seems, Cartesianism failed to gain a firm foothold in

## 5.3 Descartes in the Universities

In spite of everything that has been said so far, however, (or perhaps even *because* of the learned opposition to Descartes among older thinkers) there can be no denying that Descartes became popular with university students in late seventeenth-century Britain, and evidently it was his philosophy which took over (although perhaps only unofficially) from the now moribund scholastic Aristotelianism in the curricula of the universities.

Indeed, it seems likely that it was the increasing popularity of Cartesianism among certain kinds of university student which gave rise to the religious reaction against Descartes which began in the late 1660s.

This can be glimpsed, for example, in the reminiscence of Roger North about his arrival in Cambridge in 1667:

(p. 136) At that time new philosophy was a sort of heresy, and my brother [Francis, later to become Lord Chancellor] could not encourage me much in it ... But I found such a stir, about Descartes, some railing at him, and forbidding the reading him, as if he had impugned the very Gospel, and yet there was a general inclination, especially of the brisk part of the university, to use him, which made me conclude, there was somewhat extraordinary in him, which I was resolved to find out. (North 1887: 15–16)

The attempts to reject, even ban, Cartesianism which North mentions had begun much earlier, though evidently with little success.<sup>40</sup> In 1668, however, the Vice-Chancellor, Edmund Boldero, issued a decree forbidding disputations on Cartesian philosophy, and reasserting that only Aristotle's philosophy should be the basis for disputations (see Gascoigne 1989: 54). In spite of this, Cartesianism gradually became part of the curriculum. When Joshua Barnes, fellow of Emmanuel, sometime after 1678 updated Richard Holdsworth's *Directions for a Student at the Universities*, originally written in the 1640s, he accepted that, 'because the course of Philosophical studies is now altered', students could 'make use of Des Cartes his Book of Meteors, also his De Passionibus and etc.; as also of Le Grand, Regius and other Cartesians e.g. Rohault and others'.<sup>41</sup> In Oxford in the 1690s students were disputing whether brute animals think, whether the seat of the mind was in the pineal gland, and whether the passions were mechanical movements (Rogers 1985: 301).

The fact that it was Cartesianism rather than some other version of the new mechanical philosophies which ended up being accepted in the universities in this way perhaps needs no explanation. It is arguable that Descartes won the day simply because of the power of his philosophical system compared to that of the others. In view of what we have said earlier, however, about the persistent critiques of Descartes, it is perhaps worth noting that the alternatives all had problems of their own. Hobbes' philosophy was too tainted with materialism, and therefore atheism, to ever be allowed to creep into the universities (see Mintz 1962). Although Cartesianism could be accused of atheism, its dualism meant that it could also be defended from the charge in a way that Hobbes' philosophy could not. Gassendi's Epicureanism never really thrived in the same way as Cartesianism, possibly again because of the association with atheism, but equally perhaps because its English champion, Walter Charleton, never made much of himself and came to be regarded, even in his own lifetime, as at best a second-rank thinker.<sup>42</sup> Sir Kenelm Digby's system was recognized as having been bound up with his counter-reforming efforts on behalf of the Roman Church, and anyway tried too hard to (p. 137) maintain that it was in keeping with Aristotelian doctrines (see Henry 1982, 2009). That only left the experimental philosophy that was being promoted by the leading Fellows of the Royal Society. This had also been criticized on religious grounds, and was also regarded by many in the universities as a threat to their monopoly on higher education; but perhaps equally significantly there was no one single publication which embodied the experimental natural philosophy in such a way that it could have been used for pedagogical purposes.<sup>43</sup> Given the fact that innovations in the sciences were too well established to be dismissed, and that their devastating implications for Aristotelianism were impossible to ignore, university curricula in natural philosophy had to change. When it came down to it, therefore, Cartesianism had the best chance of filling the bill, even in the teeth of the

criticisms habitually levelled against it.

We have already noted that Antoine Le Grand's 1671 textbook of Cartesianism was revised and expanded in 1672 as a result of its popularity in Cambridge. It was then reprinted throughout the seventies and appeared in English translation in 1694.<sup>44</sup> In 1682 and 1686 the university press reprinted Johannes Schuler's *Exercitationes ad principiorum philosophiae Renati Des Cartes*. Also popular was the Latin translation of the textbook prepared by one of Descartes' chief followers, Jacques Rohault. Although reprinted in London in 1682, the Latin translation of 1674 was poor, and John Ellis, a fellow of Gonville and Caius College, who was evidently keen on Cartesianism, persuaded one of his students, Samuel Clarke, to prepare a new translation.

The precocious Clarke was already aware of the superiority of Newton's philosophy, however, and took the trouble to consult with William Whiston, Newton's successor to the Lucasian Chair in Cambridge, about the advisability of preparing a new translation of a Cartesian work. 'I well remember the answer I made him', Whiston later wrote:

since the Youth of the University must have, at present, some System of Natural Philosophy for their Studies and Exercises; and since the true System of Sir *Isaac Newton* was not yet made easy enough for the Purpose, it was not improper, for their Sakes, yet to translate and use the System of Rohault ... but that as soon as Sir *Isaac Newton*'s Philosophy came to be better known, that only ought to be taught, and the other dropp'd. (Whiston 1730: 5)

And so it was that Clarke's Latin translation of Rohault's *Physica* appeared in 1697. As if Clarke was aware of Casaubon's criticism of Cartesians as lacking in erudition, however, Clarke explicitly declared in the Preface that rather than make an oracle of Descartes he would add notes providing 'a full answer to such objections made against the author'. Displaying his scholarly credentials in these notes, Clarke (p. 138) referred to a wide array of ancient and modern philosophers, but especially Newton.

This work proved so popular that it was revised for new editions in 1702 and 1710. In each one Clarke dramatically increased the length of his annotations to allow him to present successively more detailed accounts of Newton's philosophy as an alternative to Cartesianism. In 1702 the annotations were about a fifth of the length of Rohault's text, by 1710 they had expanded to between a quarter and a third of the length of the Cartesian text. Furthermore, by 1702 Newton's name was being invoked on the title page: 'with annotations from the Philosophy of the illustrious Isaac Newton' (Rohault 1702).

It would seem, then, that Clarke was not content merely to present Rohault's Cartesianism for the use of students, and to wait for someone else in due course to present, in the words of Whiston, 'the true system of Sir Isaac Newton's ... made easy enough for the purpose'. The success of Rohault's Cartesianism among students, which called for successive editions, allowed Clarke to effectively turn this supposedly Cartesian textbook into the first popular account of Newtonian philosophy. Benjamin Hoadly, editor of Clarke's *Works*, writing in 1738 said that:

To this day his translation of Rohault is, generally speaking, the standing text for lectures; and his notes, the first direction to those who are willing to receive the reality and truth of things in the place of invention and romance. (Clarke 1738, 1: ii)

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## Notes:

(1) Voltaire 1733, Letter XIII; see also Letter XIV; D'Alembert 1995, part II: 80.

(2) Letter from William Petty to Henry More, 1648, Hartlib Papers VII: 123, quoted from Webster 1962: 367; Parker 1666: 57.

(3) British Library, Add. MSS. 32526, f. 43v; quoted from Korsten 1981: 50.

(4) On Descartes' influence in France and the Netherlands see, for example, Jolley 1992, Lennon 1993, and Verbeek 1992.

(5) For a useful introduction to the wider impact of Copernican theory see Cohen 1987.

(6) The chief system builders were Paracelsus, Girolamo Fracastoro, Jean Fernel, Girolamo Cardano, Bernardino Telesio, and Francesco Patrizi, all of whom could be said to have been influenced by ideas first adumbrated by Marsilio Ficino. See, for example, Kristeller 1964 and Hirai 2005. On the parallel revival of Epicurean atomism, made possible by the Renaissance recovery of Lucretius' *De rerum natura*, see Wilson 2008. On the links between this and developments in alchemical thought and practice see van Melsen 1960 and Newman 2006.

(7) For an introduction to Descartes' system of natural philosophy see, for example, Gaukroger 2002. Descartes insists upon the comprehensive nature of his system in paragraph 199 of Part IV of his *Principia*: 'That no phenomena of nature have been omitted in this treatise'.

(8) For an account of Bacon's philosophy see, for example, Gaukroger 2001.

(9) For an account of the development of Baconian philosophy in England see Webster 1975. Earlier background on English empiricism can be found in Harkness 2007, and more detail on the figures discussed by Webster in Greengrass, Leslie, and Raylor 1994. See also Henry 1992.

(10) On the Royal Society see, for example, Hunter 1989. On the French Académie see Hahn 1971 and Stroup 1990.

(11) On Cartesian mechanical philosophy see, for example, Gaukroger 2002. For a broader picture see, for example, Dijksterhuis 1961.

(12) The best study of Beeckman is available only in Dutch—Berkel 1983—but see also Waard 1939–1953 and Berkel 2000.

- (13) On Beeckman's influence on Descartes see, for example, Gaukroger 1995, Berkel 2000, and Gaukroger and Schuster 2002.
- (14) Sorell 1995: 85. See also, for example, Martinich 1999.
- (15) On Digby see Kargon 1966; Dobbs 1971, 1973, 1974. On Digby and White see Henry 1982, 2009.
- (16) On Boyle's natural philosophy, consult the various essays in Hunter 1994, Anstey 2000a, and Hunter 2009. For detailed consideration of the influence of Daniel Sennert and Joan Baptista van Helmont upon his work, see Newman 2006 and Clericuzio 1993.
- (17) See Anstey 2000a, Hunter 2009, Clericuzio 1993, and Newman 2006.
- (18) See Gelbart 1971, Sharp 1973, Kargon 1966, and Booth 2005.
- (19) On this aspect of Cartesian matter theory see Gaukroger 2002.
- (20) The first comment made by Roger North, see Korsten 1981: 45; the second reported to Locke by James Tyrrell, see Rogers 1985: 302.
- (21) In its details, however, Locke's concept differed from Descartes'; see Ayers 1998 and Chappell 1994.
- (22) See Jolley 1992: 403. On Huygens see Yoder 1988. On Malebranche see, for example, Pyle 2003.
- (23) Burthogge 1921: 18. Stillingfleet 1662, Bk. I, Section II.
- (24) On this see, for example, Atherton 2005. Rogers 1985: 301 goes so far as to say that in seventeenth-century Britain 'No serious work in optics is intelligible without a knowledge of Cartesian theory'. He illustrates this with a citation to *Essay* IV. ii. 11.
- (25) Boyle, for example, uses the phrase in his *Free Enquiry into the vulgarly Received Notion of Nature* (1686). See B 10: 508. I owe this reference to Peter Anstey.
- (26) See Roger 1982 and Harrison 2000.
- (27) See, for example, Des Chene 2001.
- (28) For a full account see Frank 1980 and Brown 1981.
- (29) See Rogers 1985: 301–2 for further indications.
- (30) See Spiller 1974; see also, for example, Sergeant 1698: 108–9.
- (31) The classic study is Jones 1961.
- (32) Casaubon, 'On Learning', in Spiller 1980: 205.
- (33) On Voetius, see van Ruler 1995.
- (34) For a detailed study of the theological background to this idea see Harrison 2007.
- (35) Descartes, *Principia philosophiae*, Part III, articles 1–3; *Fourth Meditation*, paragraph 6.
- (36) Hall and Hall 1962: 89–156. It is perhaps worth noting that the date of this important document is disputed. Betty Jo Teeter Dobbs claimed it was written about 1685, as a draft for the *Principia*. Some have accepted this dating but the Halls,

R.S. Westfall, and others have dated it to the late 1660s. Alan Gabbey has recently established that it cannot have been written before 1668 (Gabbey, 2012). See Dobbs 1991: 143–6; but compare with Steinle 1991, and Henry 2011: 23–6, who favour the earlier date.

(37) It should be noted that by ‘metaphysics’, Newton means here what we could call ‘religion’. It is perhaps worth remarking also that Newton here takes a diametrically opposite view to Descartes on the relationship between body and space. For Descartes, space is defined as nothing more than the extension of body, while for Newton, bodies are nothing more than space made impenetrable.

(38) See, for example, Pyle 2003.

(39) For more on Boyle’s occasionalism see Anstey 1999 and 2000a: 197–200.

(40) See Nicolson 1929, Lamprecht 1935, Spiller 1974, and Spiller 1980: 60–79.

(41) Quoted from Gascoigne 1989, 55; see Emmanuel College, Cambridge, MS 179: 56.

(42) See Henry 2004. Charleton effectively abandoned the attempt to promote a new system of natural philosophy after the Restoration and published only medical works of restricted purview; see Booth 2005.

(43) See Spiller 1980 and Hunter 1989. There was no one work by Boyle, for example, which provided a synoptic account of the whole of ‘Experimental Philosophy’.

(44) Successive Latin editions appeared in 1672, 1675, and 1680. The English translation appeared as *An Entire Body of Philosophy according to the Principles of the Famous Renate Des Cartes*, London, 1694.

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## Observation and Mathematics

Mary Domski

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## Abstract and Keywords

This chapter, which examines the unity shared between what appear to be conflicting modes of natural investigation, an often neglected aspect of the history of British natural philosophy, also discusses the views of Francis Bacon on observation and experiment and describes his system of the sciences. It looks at aspects of Bacon's program for natural philosophy that made critics set the divide Baconian natural philosophy and the mathematical sciences of the seventeenth century. The chapter furthermore highlights the role of the Baconian system of the sciences in the acceptance of Isaac Newton's *Principia mathematica*.

Keywords: natural investigation, British natural philosophy, Francis Bacon, observation, experiment, mathematical sciences, Isaac Newton, *Principia mathematica*

THE revolutionary character of seventeenth-century British natural philosophy is often, and with good reason, associated with the proposals made by Francis Bacon in his *New Organon* (1620; OFB 11). As the standard story has it, Bacon initiated an 'empirical' revolution against the logical and demonstrative standards of natural knowledge associated with Scholasticism by proposing a method of natural investigation grounded on careful observation, experimentation, and the construction of natural histories. And, the story continues, as the century drew on, this new empirical method also served to distinguish British natural philosophers from the Cartesians on the Continent, who offered a competing, 'rationalist' and mathematically oriented approach to nature and natural philosophy (e.g. see Dear 2009). To be sure, this story has historical merit. Bacon was in fact an outspoken critic of scholastic methods for investigating nature in the *New Organon* and other texts, and his demand for a programme of natural philosophy centred on observation, experiment, and natural history was echoed and embraced by important figures of seventeenth-century British natural philosophy, many of whom also fashioned themselves as opponents of Scholasticism as well as continental Cartesianism.

While there is no question that Bacon left a lasting imprint on the practice of natural philosophy in the seventeenth century, the legacy of Bacon and Baconianism has recently suffered a peculiar and perhaps unfortunate fate in the hands of historians of science and philosophy. Given that it has become commonplace, especially in the last century, to hail Isaac Newton's *Principia* (1687) as the crowning (p. 145) achievement of seventeenth-century natural philosophy—as that work which successfully displaced the scholastic and Cartesian ways of investigating nature and which established the truth of the Copernican system—commentators continue to question the *importance* of the British turn to observation and experiment for the progress of seventeenth-century natural philosophy. Alexandre Koyré and Thomas Kuhn have been highly influential in this regard. Taking as his given both the evident differences between natural-historical and mathematical approaches to nature and the triumph of the latter over the former, Koyré goes so far as to claim that Bacon's 'role in the history of the



scientific revolution was completely negligible' (Koyré 1978: 1). In the footnote appended to that claim, he goes further and states with evident frustration that:

'Bacon, the founder of modern science' is a joke, and a bad one at that, that one can still find in text books. In fact Bacon understood nothing about science. He was credulous and completely uncritical. His manner of thinking was closer to alchemy and magic (he believed in 'sympathies'), in short to that of a primitive or to a thinker of the Renaissance than to that of a Galileo or even a Scholastic. (Koyré 1978: 39 n1)<sup>1</sup>

For a similar (though less dismissive) assessment of seventeenth-century Baconianism, we can turn to Kuhn's highly influential 'Mathematical versus experimental traditions in the development of physical science' (1977).<sup>2</sup> In this paper, Kuhn highlights the different uses of experiment in the 'classical' physical sciences that took their birth in antiquity (viz. astronomy, optics, harmonics, and mathematics), and the Baconian sciences that allegedly emerged in the seventeenth century (viz., magnetism, electricity, and chemistry).<sup>3</sup> He finds that while the experiments of the classical sciences were commonly used to support some already existing theory, the experimentalists working in the Baconian tradition relied on the execution and accurate description of actual and repeatable experiments, and moreover, the experiments thus executed were, as Kuhn puts it:

seldom aimed to demonstrate what was already known or to determine a detail required for the extension of existing theory. Rather they wished to see how nature would behave under previously unobserved, often previously nonexistent, circumstances. Their typical products were the vast natural or experimental histories in which were amassed the miscellaneous data that many of them thought prerequisite to the construction of scientific theory. (Kuhn 1977: 43)

(p. 146) Kuhn downplays the significance of the experimental results produced by Baconians, claiming that '[t]he transformation of the classical sciences during the Scientific Revolution is more accurately ascribed to new ways of looking at old phenomena than to a series of unanticipated experimental discoveries' (Kuhn 1977: 46). Thus, much as Koyré, Kuhn concludes that '[t]o the conceptual transformations of the classical sciences', and thus to the revolution completed by Newton, 'the contributions of Baconianism were very small' (Kuhn 1977: 45).<sup>4</sup>

It is not possible here to argue against Koyré and Kuhn by establishing a direct line of influence stretching from Bacon to Newton. Nonetheless, in what follows, I will revisit the possible connection between these figures, each of whom stands as a pioneer in what seem to be two very different traditions of natural philosophy. My goal is to show that by focusing on a particular line of how Bacon's programme for natural philosophy was interpreted and extended, we can in fact find a quite natural connection between what Bacon envisioned for our study of nature and Newton's achievements in the *Principia*. Namely, by taking our cues from Thomas Sprat and Robert Boyle, who took seriously Bacon's attempt to establish a *system* of the sciences, we gain a portrait of Baconianism according to which observation, experiment, and natural history provided a foundation for a programme that was to include both the so-called Baconian and the so-called classical physical sciences. It is this portrait I will illuminate before I turn to the reading of Newton's *Principia* offered by John Locke, a reading influenced by Boyle's appreciation for the interplay of experiment and mathematics in natural philosophy, and a reading that suggests that those adopting a Baconian ideal for investigating nature could embrace and accept Newton's mathematical natural philosophy, albeit in an importantly qualified sense. My goal throughout is to bring greater light to an aspect of seventeenth-century British natural philosophy that the standard story misses, namely, an appreciation for the unity shared between what appear to be conflicting modes of natural investigation.

## 6.1 Bacon on Observation and Experiment

There is a tendency among historians to try to capture the novelty of Bacon's new method for natural philosophy by emphasizing what Bacon's method is not: it is *not* modelled on scholastic principles of logic and deduction, and it is *not* a (p.

147) programme with any clear affinity to the mathematical and rational approach to nature adopted by natural philosophers on the Continent. This tendency is likely a result of Bacon's own efforts in the *New Organon* to carve a place for his programme precisely by distancing it from the methods embraced by his predecessors and contemporaries. As he presents it, his way of investigating nature offers a unique alternative to the methods adopted by other natural philosophers, because it grants a privileged role to observation and experimental evidence. For instance, in the early portions of the *New Organon*, Bacon draws the distinction between his method and the scholastic method as follows:

There are and can be only two ways of investigating and discovering the truth. The one rushes up from the sense and particulars to axioms of the highest generality and, from these principles and their indubitable truth, goes on to infer and discover middle axioms; and this is the way in current use. The other way draws axioms from the sense and particulars by climbing steadily and by degrees so that it reaches the ones of highest generality last of all; and this is the true but still untrodden way. (OFB 11: 71)

Bacon admits that both ways of investigating nature 'start from the sense and particulars', and that both also 'end in the highest generalities', that is, they both aim to determine the axioms that govern nature. However, he maintains that the difference between their methods is 'vast', because the Scholastics make inadequate use of sensory evidence. On his account, they fly too swiftly from the senses, merely touching 'on experience and particulars cursorily', and thus establish 'abstract and useless generalities right from the start' (OFB 11: 73).

Bacon solicits the same reasons for rejecting the experimental natural philosophy embraced by his contemporaries. He states quite bluntly that 'the means of gaining experience [*experiendi*] now in use is blind and stupid' and condemns it as 'a bad kind of demonstration' (OFB 11: 111–13). The experimentalists of his day have reached this fate, he claims, because they do not allow experience to serve as their guide to reaching a true understanding of nature; they move too quickly to generalities and, thus, as they attempt to establish the axioms of nature, they 'meander and wander about with no pathway marked out, and only taking a lead from what they bump into' (OFB 11: 111). Thus, Bacon charges contemporary chemists with a crime similar to the one committed by Aristotle: just as Aristotle renders his natural philosophy 'virtually useless and disputatious' because it is divorced from careful observation and made a mere 'slave to his logic', 'the pack of chemists has founded a fantastic philosophy on a few furnace experiments' (OFB 11: 89). Tied with this mistake is the experimentalists' failure to conduct experiments that enable them to discover the true causes governing natural bodies. In Bacon's terms, they are rash and impatient, resting content with experiments that produce new works (i.e. experiments of Fruit) and neglect to perform experiments that offer insight into nature's secrets (i.e. experiments of Light) (cf. OFB 11: 111–13).

(p. 148) Having brought the failures of the Scholastics and experimentalists into clearer view, Bacon presents his new way of pursuing natural philosophy as the middle, yet untrodden path between these two ways of investigating nature. It is a programme that is grounded on the *proper* use of sensory evidence, a programme that requires that the natural philosopher first involve himself with experience in a 'proper and systematic way' and then gradually rise to generalities 'which really are better known to nature' (OFB 11: 73). He characterizes the position of his approach to nature in his contemporary milieu as follows:

Those who have dealt with the sciences have either been empirics or dogmatists. The empirics, in the manner of the ant, only store up and use things; the rationalists, in the manner of the spiders, spin webs from their own entrails; but the bee takes the middle path: it collects its material from the flowers of field and garden, but its special gift is to convert and digest it. The true job of philosophy is not much different, for it depends not only or mainly on the powers of the mind, nor does it take the material gathered from natural history and mechanical experiments and store it unaltered in the memory but lays it up in the intellect changed and elaborated. Therefore from a closer and purer alliance (not so far achieved) of these two faculties (the experimental and the rational) we should have good hopes. (OFB 11: 153)

As Bacon insists, it is only with an orderly view of natural bodies that observation and experimental method can offer a path to truth. Thus, the 'closer and purer alliance' that Bacon envisions for his programme of natural philosophy, one that brings

the experimental and rational into proper balance, is famously grounded on the construction of newly formed natural histories.

In *A History Natural and Experimental for the building up of Philosophy* (1622; OFB 12), which was published two years after the *New Organon* and serves as Part 3 of the *Great Instauration*, Bacon echoes claims made in his earlier work and urges us to ‘cast aside thoughts of philosophy ... until a tried and tested natural history has been collected and constructed’ (OFB 12: 7). We must do so because:

once a faithful and abundant history of nature and the arts has been collected and arranged, and once it has been unfolded and placed as it were before men’s eyes, there will be no mean hope that those great intellects of whom I have spoken ... will, once the right timber and material have been obtained, raise much more solid constructions. (OFB 12: 13)

Building on the remarks made in the *New Organon*, Bacon again emphasizes the foundational role that natural history plays in his programme of natural philosophy and states quite bluntly that ‘my *Organum*, even if it were finished, would not carry forward the Instauration of the Sciences much without Natural History, whereas Natural History without the *Organum* would advance it not a little’ (OFB 12: 13).

To be clear, the execution of a proper natural history requires more than simply amassing the data gathered from observation. Bacon emphasizes that in order for our observations to bring us to the truth of the natural order and to knowledge of (p. 149) the causes governing natural bodies, we must, as investigators of nature, rid ourselves of ‘idols’ and prepare our minds in order that we might glean the actual operations of nature.<sup>5</sup> And as indicated above, we must also conduct the proper sorts of experiments, namely, ‘experiments of art’, and witness nature constrained, because these experiments will lead to a better understanding of natural causes (OFB 11: 98). Moreover, in order that our natural histories properly inform the progress of natural philosophy, we must rely on a ‘new induction’ in order to rise from the empirical data collected in our natural histories to general axioms that accurately capture the causes at work in nature (OFB 11: 103–6; see also Anstey 2002, Pérez-Ramos 1988, Shapiro 2000).

## 6.2 Bacon and the Mathematical Sciences

While my overview of Bacon’s programme for natural philosophy has been cursory at best, my main purpose has been to highlight the features of that programme which help explain why historians such as Koyré and Kuhn have found it fitting to erect a strict divide between Baconian natural philosophy and the mathematical sciences of the seventeenth century. Given the foundational role Bacon grants to observation, experiment, and natural history, the differences between his programme and the programme adopted by mathematically minded investigators of nature (working, for instance, in optics and astronomy) become rather easy to identify. In brief, we have, on the one hand, Baconian natural philosophers committed to the careful inspection of the ‘particulars’ of nature as the means by which to capture the nature of bodies, and on the other hand, we have natural philosophers who begin their investigation of the connections between the bodies of nature precisely by ‘mathematizing’ these bodies, that is, by focusing on their geometrical and quantitative features.<sup>6</sup> The *prima facie* tension that stands between these two traditions is nicely characterized by Steven Shapin in his discussion of Robert Boyle’s attitude towards the integration of experiment and mathematics:

The experimental philosopher ... does not need to offer specific mathematical accounts of particular bodies or events in that invisible realm, and indeed he who does so runs the risk of subjecting the visible to the invisible, the readily intelligible and conceivable to the less intelligible and the esoteric, the concrete to the abstract. Boyle’s experimentalism was to be a (p. 150) science of the concrete and the particular; mathematics was understood to be the formal study of the abstract and the universal. (Shapin 1988: 41; cf. Shapin 1994, ch. 7)

It becomes all the more reasonable to read the progress of seventeenth-century natural philosophy as following one of two

very distinct paths—either the natural-historical or the mathematical—when we consider some of the texts in which Bacon addresses the mathematical approach to nature. Much as he attacked the Scholastics and experimentalists of his day, Bacon indicates that those who adopt a mathematical approach to nature, namely, those working in the fields of ‘mixed mathematics’, such as astronomy and optics, have not given due weight to empirical, sensory evidence. He remarks in particular that we see in the investigations of astronomy and harmonics ‘on how few observations and natural axioms they rest’ (OFB 11: 135) and indicates that this neglect of natural evidence and the embrace of idealizations and abstractions have turned practitioners away from ‘a properly established order’:

So men should not be surprised if they have not covered the whole range of the sciences, seeing that they have gone off course altogether; either by leaving and deserting experience entirely, or by getting caught up in it and running up and down as in a labyrinth; whereas a properly established order leads by a direct road through the woods of experience to the open ground of axioms. (OFB 11: 131)

Bacon’s critique of the method of mixed mathematics is also found in the later *De augmentis scientiarum* (1623, SEH, 4). Here, when discussing the Idols of the Tribe, Bacon links the abstractions of the mathematician with the idols of the mind and, as Stephen Gaukroger puts it, Bacon indicates that when appealing to the idealizations of mathematics the ‘human mind presupposes and assigns to nature greater equality and uniformity than there really is, taking as his example the contrivance of mathematicians in making all heavenly bodies move in perfect circles, instead of, say, spirals’ (Gaukroger 2001: 26). The suggestion is that to start with an idealized system of mathematics, as the astronomer does, is to distort the evidence gained through our senses and our experiments. The ‘properly established order’ must instead begin with ‘a most painstaking dissection and anatomy of the world’ in order that we may establish ‘a true pattern of the world as we actually find it and not as someone’s own private reason hands it down to him’ (OFB 11: 187).

In light of the above remarks, Gaukroger (2001) and Kuhn (1977) have interpreted Bacon as offering a wholesale rejection of astronomy (and mixed mathematics in general). For instance, coupling Bacon’s remarks from the *New Organon* and *De augmentis scientiarum* with the claim in the *Advancement of Learning* (1605; OFB 4) that the Copernican and Ptolemaic systems ‘save the phenomena’ equally well (OFB 4: 92), Gaukroger claims that what Bacon offers ‘is not so much a criticism of Copernicanism but rather a general criticism of astronomy, considered as a mathematical discipline’ (Gaukroger 2001: 26). In a similar vein, though without appeal to any specific texts, Kuhn claims more strongly:

(p. 151) Bacon himself was distrustful, not only of mathematics, but of the entire quasi-deductive structure of classical science. Those critics who ridicule him for failing to recognize the best science of his day have missed the point. He did not reject Copernicanism because he preferred the Ptolemaic system. Rather, he rejected both because he thought that no system so complex, abstract, and mathematical could contribute to either the understanding or the control of nature. (Kuhn 1977: 48)

While the criticisms Bacon levels at the mixed mathematical sciences offer some support to Gaukroger’s and Kuhn’s assessment of Bacon’s attitude towards astronomy, further textual evidence indicates that their readings require qualification. For, according to the system of the sciences that Bacon urged natural philosophers to establish, we find that he does not demand that astronomy relinquish its use of mathematics or, more generally, that the mixed mathematical sciences relinquish their use of abstraction and idealization. Rather, what he demands is that the mathematical treatment of nature, and of the heavens in particular, be grounded on and informed by the findings of natural history.

Consider, for instance, the framework for the sciences that Bacon presents in the *Advancement of Learning* (1605; OFB 4) immediately prior to discussing the differences between pure and applied (mixed) mathematics. As he has it, natural science (or natural theory) is divided into ‘physic’ and ‘metaphysic’, where the former treats ‘that which is inherent in Matter’, so as to identify material and efficient causes and the latter contemplates that which is ‘abstract and fixed’ with the aim of establishing formal and final causes (OFB 4: 82). And in Bacon’s scheme for natural science, which he likens to a pyramid (cf. OFB 4: 85), natural history stands at the basis of both physic and metaphysic, because natural history offers a description of ‘the *varietie of things*’ that must inform our search for causes, whether the ‘variable and respective’ causes

of physic or the ‘fixed and constant’ causes of metaphysic (OFB 4: 82).

In an important passage that follows this discussion, Bacon addresses the status of mathematics in his pyramid of the sciences. While he is careful to point out that starting our investigation into the nature of bodies by use of mathematics distorts our view of material objects, he does not discount the use of mathematics whole-cloth. Instead, he claims that it has a role to play in advancing our knowledge of nature, precisely because it is a part of metaphysics, i.e. a part of our search for formal and final causes in nature. He writes:

Neverthelesse there remaineth yet another part of NATURALL PHILOSOPHIE, which is commonly made a principall part, and holdeth ranke with PHISICKE speciall and METPHISICKE which is *Mathematicke*, but I think it more agreeable to the Nature of things, and to the light of order, to place it as a Branch of *Metaphisicke*: For the subject of it being *Quantitie*, not *Quantitie Indefinite*: which is but a *Relative*, and belongeth to *Philosophia Prima* ... but *Quantitie determined, or proportionable*, it appeareth to bee one of the *essentiall formes* of things; as that, that is causative in Nature of a number of Effects, insomuch as we see in the Schooles both of *Democritus*, and of *Pithagoras*, that the one (p. 152) *did ascribe Figure to the first seedes of things*, and the other *did suppose numbers to bee the Principles and orginalls of things*. (OFB 4: 87)

Though Bacon admits that mathematics is less ‘immersed in Matter’ than other ‘formes’, and has thereby garnered increased popularity (OFB 4: 88), we notice above that in so far as mathematics treats determinate quantities, i.e. quantities which ‘appeareth to bee one of the *essentiall formes* of things’, it can assist us in disclosing the causal processes of nature. A similar point is reiterated in his discussion of pure and mixed mathematics:

The MATHEMATICKS are either PURE, or MIXT: To the PURE MATHEMATICKS are those Sciences belonging, which handle *Quantitie determinate*, meerey severed from any Axiomes of NATURALL PHILOSOPHY: and these are two, GEOMETRY and ARITHMETICKE, The one handling Quantitie continued, and the other dissevered. MIXT hath for subject some Axiomes or parts of Naturall Philosophie: and considereth Quantitie determined, as it is auxiliarie and incident unto them. For many parts of Nature can neither be invented with sufficient subtiltie, nor demonstrated with sufficient perspicuitie, nor accommodated unto use with sufficient dexteritie, without the aide and interveyning of the Mathematicks: of which sorte are *Perspective, Musicke, Astronomie, Cosmographie, Architecture, Inginarie*, and divers others. (OFB 4: 88)

Notice here that, according to Bacon, practitioners in the mixed mathematical disciplines are focused on parts of nature that cannot be adequately investigated ‘without the aid and intervening of Mathematics’.<sup>7</sup> They are thus justified in using their idealizations and abstractions, and moreover, Bacon voices an optimism that such ideal and abstract investigations will increase in number as we learn more about the natural order: ‘And as for the *Mixt Mathematickes* I may onely make this prediction, that there cannot faile to bee more kindes of them, as Nature growes further disclosed’ (OFB 4: 88).

The portrait we have of Bacon in 1605 is thus not of a Bacon who is distrustful of mathematics; he may have been distrustful of its use in guiding *experimental* practice but he was certainly not rejecting its usefulness, or even its necessary role, in the examination of particular provinces of the natural world. In light of the above remarks, and specifically, in light of Bacon’s placement of mixed mathematics as a part of metaphysics—as belonging to that domain of natural philosophy that treats formal and final causes—his claims do not indicate a wholesale rejection of mathematics in natural philosophy, as Gaukroger and Kuhn suggest. Rather, Bacon’s point is that we must be careful to put mathematics in its proper place, as a tool that can be used to investigate certain domains of nature after a proper natural history and physics have been established. In other words, we should not *begin* our (p. 153) study of bodies with the idealization and abstraction characteristic of mathematics; we should only turn to it once a solid foundation of knowledge concerning bodies is in place.<sup>8</sup>

As emphasized by Graham Rees (1986), this stance remains a feature of Bacon’s programme for natural philosophy into the later period of his writings. In fact, Rees argues quite convincingly that by the 1623 revised Latin version of the *Advancement of Learning*, Bacon had become a stronger advocate of the mixed mathematics (SEH 4: 370, cited in Rees



1986: 412). While Bacon was no doubt worried about the current state of affairs in natural philosophy, and worried in particular about the guiding role that had been granted to mathematics by some natural philosophers, his call in *De augmentis scientiarum* is for a reorientation towards mathematics, not a rejection of it. Specifically, with mathematics now presented as an appendix and auxiliary to *all* the sciences, as Rees notes, ‘Bacon has shifted his position in favour of acknowledging a much wider role for mathematics in the natural sciences’ (Rees 1986: 412; *pace* Feingold 2001: 80).

This reading of Bacon’s attitude towards mixed mathematics sheds important light on remarks offered in the *New Organon*. Though the emphasis is placed on observation, experiment, and the construction of natural history (as indicated above), the place for mathematics in our pursuit of natural philosophy is not ignored in this context. For instance, echoing the sentiments expressed in the *Advancement of Learning*, he claims that natural philosophy ‘should be regarded as the great mother of the sciences’ and moreover, that ‘all arts and all sciences, if wrested from this root [of natural philosophy], can perhaps be refined and adapted to use but they will not grow at all’ (OFB 11: 125). He laments the fact that natural philosophy ‘has, with wonderful indignity, been forced into the role of a servant, dancing attendance on the business of medicine and mathematics’, and then, turning his attention to the mixed mathematical sciences, he remarks:

Meanwhile let no one hope for great progress in the sciences (especially in the operative department) unless natural philosophy be extended to the particular sciences, and these in their turn reduced to natural philosophy. For hence it comes about that astronomy, optics, music, many of the mechanical arts, and medicine itself, and (which may surprise you) moral and political philosophy, and the science of logic have practically no depth but skate over the surface and variety of things; because once these are dispersed and set up as particular sciences, they are no longer nourished by natural philosophy; which could have given them new strength and growth at [the] source and from a true knowledge of motions, rays, sounds, textures and schematisms of bodies, affections and intellectual apprehensions. Since, therefore, the sciences have been cut off from their roots, it is no wonder that they do not grow. (OFB 11: 127)

(p. 154) The tenor of this assessment fits well with the project of reform Bacon presents in the *New Organon*. As the Scholastics and contemporary experimentalists, those working in the mathematical sciences have lost their way, because they have not allowed natural philosophy—a discipline which must be grounded on natural history—to guide their study of nature. Nonetheless, these sciences can be put on their proper path if they accept the place of mathematics below natural history and experiment, and moreover, natural philosophers of all stripes could benefit from mathematics if they are mindful that ‘inquiries into nature have the best result when they *begin* with physics and *end* in mathematics’—that is, when a physical object is converted into mathematical one (SEH 4: 126, emphasis added).<sup>9</sup>

## 6.3 The Baconian System of the Sciences

At first blush, a reconsideration of Bacon’s attitude towards mathematics may seem to have little consequence for our reading of the progress of the Baconian tradition in the seventeenth century. For, as emphasized in recent scholarship, whatever *Bacon’s* vision of how mathematics ought to be incorporated into our study of nature, his importance for seventeenth-century British natural philosophy remains his emphasis on observation, experiment, and natural history. For instance, Mordechai Feingold (2001) draws our focus to the opposition towards the mathematical study of nature shared by notable Baconian ‘naturalists’ in the Royal Society of London (chartered in 1662). Feingold appeals to texts which reveal a tension between those who adopted Bacon as their guide to natural philosophy and those who were bent on a mathematical treatment of natural bodies. For instance, we have in Thomas Sprat’s *History of the Royal-Society* (1667) an account of how members of the Royal Society registered their experimental results, an account that indicates that the simple amassing of evidence, without appeal to principles, hypotheses, or theories, was the foundation for the Baconian experimental method embraced by members of the early Royal Society:

The *Society* has reduc’d its principal observations, into one *common-stock*; and laid them up in publique

*Registers*, to be nakedly transmitted to the next Generation of Men; and so from them, to their Successors. And as their purpose was, to heap up a mixt Mass of *Experiments*, without digesting them into any perfect model: so to this end, they confin'd themselves to (p. 155) no order of subjects; and whatever they have recorded, they have done it, not as compleat Schemes of opinions, but as bare unfinish'd Histories. (Sprat 1667: 115; cited in Feingold 2001: 79)

While there are questions surrounding the accuracy of Sprat's account (see Wood 1980; Hunter and Wood 1989), there are other examples from practising Baconians that reveal an embrace of experiment *over* mathematics. For instance, in *Certain Physiological Essays*, Robert Boyle voices his discontent with investigations of nature that take a mathematical view of natural bodies as their starting point. Boyle cautions that:

we must not expect from Mathematicians the same accurateness, when they deliver Observations concerning such things wherein 'tis not only Quantity and Figure, but Matter, and its other Affections, that must be consider'd. (B 2: 74–5; cited in Feingold 2001: 81)

He claims as well that:

the *Phænomena*, which the Mathematician concurs to exhibit, do really belong to the Cognizance of the Naturalist. For when Matter comes once to be endow'd with Qualities, the Consideration how it came by them, is a Question rather about the Agent or Efficient, than the nature of the Body it self. (B 6: 441; cited in Feingold 2001: 81)

In light of such remarks by Sprat and Boyle, we could very well conclude that what Bacon saw as a possible partnership between mathematics and experimentalism later turned into a dispute between these two camps of natural philosophy. In other words, and in the spirit of Kuhn (1977), we might very well conclude that natural philosophers of the late seventeenth century were wedded *either* to a Baconian *or* to a mathematical programme of investigating nature, with no significant intermingling between the two traditions.

However, as in the case of Bacon, we need to take some care with the pronouncements provided above and look to the broader context in which they were made. In line with the recent work of Peter Anstey (2005), such apparent distaste for the mathematical sciences takes on a different flavour when we temper the remarks from Baconians such as Sprat and Boyle by appeal to the distinction between 'experimental' and 'speculative' natural philosophy. As Anstey presents it, this distinction was embraced to explain the methods proper to natural philosophy, and among several 'experimental' natural philosophers, we find an apparent rejection of speculative methods, because the:

speculative philosopher ... indulged in hypotheses without recourse to observation and experiment at all, or only as an afterthought in order to save the phenomena or in order 'to adapt them to their Hypothesis'. Speculative philosophers either failed to admit any relation between hypotheses and experience or subordinated experience to the hypothesis at hand. (Anstey 2005: 224)

(p. 156) Nonetheless, and as Anstey points out, the distinction was not always presented as a simple either–or such that one promoted *either* experimental *or* speculative methods. From Sprat and Boyle in particular we find an attempt to bring these modes of natural philosophy into a fruitful cooperation. And looking at the broader context of Sprat's and Boyle's remarks, we find that they, as Bacon, were not dismissing 'metaphysical' and 'speculative' approaches to the causes in nature; rather, they were emphasizing that there must be a proper order of investigation such that the 'metaphysical' and 'speculative' be informed by the experimental.

Thus, while Sprat lays clear emphasis on the experimental techniques adopted by the current members of the Royal Society (Sprat 1667: 257, 341), he also emphasizes that there is a place for 'speculative' pursuits once Baconian natural histories have been established:



To this fault of *Sceptical doubting*, the *Royal Society* may perhaps be suspected, to be a little too much inclin'd: because they always professed, to be so backward from *settling of Principles*, or *fixing upon Doctrines*. But if we fairly consider their intentions, we shall soon acquit them. Though they are not yet very daring, in establishing conclusions; yet they lay no injunctions upon their successors not to do the same, when they shall have got a sufficient store for such a work. It is their study, that the way to attain a *solid speculation*, should every day be more and more persued: which is to be done, by a long forbearing of *speculation* at first, till the matters be ripe for it; and not, by madly rushing upon it in the very beginning. (Sprat 1667: 106–7)

Moreover, when the members of the Royal Society speculate about the results of their experimental investigation of particulars and venture to make claims about the causes at play in nature, Sprat reminds us that we must be mindful that:

The causes, upon which they have agreed, they did not presently extend, beyond their due strength, to all other things, that seem to bear some resemblance to what they try'd. Whatever they have resolv'd upon; they have not reported, as *unalterable Demonstrations*, but as *present appearances*: delivering down to future Ages, with the good success of the Experiment, the *manner* of their progress, the *Instruments*, and the several differences of the *matter*, which they have apply'd: so that, with their mistake, they give them also the means of finding out. (Sprat 1667: 108; see also page 257)

How are such remarks connected with the mathematical sciences? Sprat, like Bacon, criticizes astronomers for being too secularized and practising their art at a remove from other scientists (Sprat 1667: 38–9). They do so, he indicates, because unlike members of the Royal Society, they lack an appreciation for the unity among the sciences, a unity which, Sprat claims, underwrites the community of practitioners established by the Royal Society:

There is nothing of all the works of Nature, so inconsiderable, so remote, or so fully known; but, by being made to reflect on other things, it will at once enlighten them, and shew it self the clearer. Such is the dependence of amongst all the orders of creatures; the inanimate, the (p. 157) sensitive, the rational, the natural, the artificial: that the apprehension of one of them, is a good step towards the understanding of the rest: And this is the highest pitch of *humane reason*; to follow all the links of this chain, till all their secrets are open to our minds; and their works advanc'd, or imitated by our hands. This is truly to command the world; to rank all the *varieties*, and *degrees* of things, so orderly one upon another; that standing on the top of them, we may perfectly behold all that are below, and make them all serviceable to the quiet, and peace, and plenty of Man's life. (Sprat 1667: 110, underlining added)

In line with the cooperation between experiment and speculation that Sprat encouraged above, he lays emphasis here on the unity of nature and the subsequent interconnectedness of our investigations into and knowledge of nature. Thus, much as Bacon claimed, the suggestion from Sprat is that progress in natural philosophy can only be won through an appreciation of the unity among the sciences, a unity that requires we trace the sciences back to their proper natural-historical and experimental roots.

The attempt to establish a system of the sciences is treated in more detail by Boyle. He shares the 'reconciling disposition' of Sprat (Anstey 2005: 226) and urges speculative natural philosophers to put their work in proper conversation with the results gained by the experimental natural philosopher. Now, quite famously, Boyle embraces his own role as a practical, experimental natural philosopher. For instance, he claims in his 'Proëmium Essay' (1661):

I have often found such Difficulties in searching into the Causes and Manner of things; and I am so sensible of my own Disability to surmount those Difficulties, that I dare speak confidently and positively of very few things, except Matters of fact. And when I venture to deliver any thing, by way of Opinion, I should, if it were not for meer shame, speak more diffidently than I have been wont to do ... But I am content, provided Experimental Learning be really promoted, to contribute ev'n in the least plausible Way to the Advancement of it, and had rather not only be an Underbuilder, but ev'n dig in the Quarries for Materials towards so useful a Structure, as a solid

body of Natural Philosophy, than not do something towards the Erection of it. (B 2: 19–20; see also *Defence*, B 3: 12)

Though Boyle admits his own ‘disabilities’ as a speculative naturalist and appoints himself as a practical ‘underbuilder’, we notice in these remarks that the product of his investigations will be natural histories that are to serve as the starting point for those more adept at positing causal hypotheses. It is in this spirit that we should read his claims regarding the mathematical sciences, as presented explicitly in his ‘Of the Usefulness of Mathematicks to Natural Philosophy’, which bears the subtitle ‘That the Empire of Man may be promoted by the Naturalist’s skill in Mathematicks, (as well Pure, as Mixt.)’ (published 1671; B 6: 439–51). In this essay, Boyle endorses the use of mathematics to chart the motions and positions of heavenly bodies, and he claims that it is only by applying a mathematical framework to the heavens that we will be able to decide whether the Ptolemaic or the Copernican system is the true system of the world. Thus he asks, ‘how without the knowledge of the Doctrine of the Sphere will the Naturalist be able to make any sober and well (p. 158) grounded Judgment in that grand and noble Problem, *which is the true Systeme of the World?*’ (B 6: 444; cf. pages 440, 447–8). Boyle’s further remarks suggest that mathematics can be of greater help in the arena of astronomy, because by means of mathematics we are able to catalogue the positions and motions of distant celestial bodies without relying on hypotheses about the true nature of these remote bodies or the causes of their motions. In other words, mathematics enables the astronomer to generate a map of the heavens that can serve as a reliable, metaphysics-free basis upon which causal hypotheses can be established:

That (then) the knowledge of Celestial Bodies is not well to be attain’d, nor consequently the Theories, propos’d of them, to be intelligently judg’d of, without Arithmetick and Geometrie (those Wings, on which the Astronomer soars as high as Heaven,) he must be very little acquainted with Astronomie, and particularly with the various, and too often, intricate Theories of Planets, that can doubt. (B 6: 444)

While Boyle’s discussion may not be as thorough as we might like, the suggestion in ‘Of the Usefulness of Mathematicks’ is that geometry and arithmetic—‘those Wings, on which the Astronomer soars as high as Heaven’—allow the astronomer to map the positions and motions of these heavenly spheres without also having to speculate about the metaphysical constitution of the objects under investigation. The position Boyle takes in this short tract nicely brings out the grounds for his infamous dispute with Thomas Hobbes regarding the role of mathematics in natural philosophy. Where we find Boyle attempting a reconciliation of the mathematical and the natural according to which the use of mathematics must ultimately be *grounded on* the findings of the ‘practical’ naturalist, Hobbes inverted this order. For Hobbes, the foundation of natural philosophy is mathematics itself, where its role was not merely to be a useful guide to experiment or our search for causes; mathematics offered the very model by which to pinpoint the causes of nature. Experiment and observation played a subsidiary role in Hobbes’ scheme: they were useful only in so far as the results of experiment and observation could offer instances that confirmed the occurrence of events that were mathematically and demonstratively deduced from the alleged causes of nature (see Jesseph 1996).

The position Boyle takes in ‘Of the Usefulness of Mathematicks’ also brings to light his acceptance of Bacon’s general stance towards the relationship between observation, mathematics, and astronomy. Recall that according to Bacon’s position of the 1620s, after he had removed mathematics from the domain of metaphysics, the natural historian ought to take a lead role in our investigations of the heavenly bodies (OFB 11: 85). Thus, consistent with Bacon’s pronouncement in the *New Organon* that ‘inquiries into nature have the best result when they begin with physics and end in mathematics’ (SEH 4: 126), Boyle also suggests that the natural historian must provide the foundation for the mathematical study of the heavens. And like Bacon, Boyle grants the experimental naturalist the lead role so that the (p. 159) speculative naturalist can formulate a better and more accurate rendering of other regions of nature.<sup>10</sup>

By considering the attitude towards mathematics taken by Sprat and especially Boyle, we have at least some evidence that the gulf between seventeenth-century mathematical natural philosophy and seventeenth-century experimental natural philosophy is not as wide as Kuhn and others suggest. Given the division of labour upon which their remarks are premised—given, that is, their commitment to the *cooperation* between experimental and speculative techniques—we find that Sprat’s

and Boyle's apparent wholesale rejection of mathematics is actually a rejection of the use of mathematics in the specific domain of natural history and experiment. Granting due attention to this feature of their programmes and their emphasis on the *integration* of mathematics into natural philosophy gives us reason to reconsider how we might reconcile Newton's *Principia* with the Baconian trends of the same century. To this issue I now turn.

## 6.4 Newton's *Principia* in the Baconian System of the Sciences

There has been a long tradition, tracing back to I. Bernard Cohen (1956), of looking at Newton's significance for the history of science *either* in reference to the mathematical method of the *Principia* (1687) *or* the experimental method of the *Opticks* (1704). According to the basic picture of the two Newtons, we have in the *Principia* a method that fits best with the mathematical tradition of Galileo and Descartes, and in the *Opticks* a method that is more akin to the experimentalism promoted by Bacon and Boyle. Certainly, the 'empiricism' and experimentalism of the *Principia* have not been ignored in recent literature (Cohen 1983; Smith 2002; Bertoloni Meli 2006). Yet when the *Principia* has been taken to be emblematic of Newton's peculiar version of 'empiricism', the guiding theme of many such discussions has been the allegedly sharp contrast between Newton's 'empiricism' and that embraced by Baconians of the seventeenth century (see McGuire 1995; Shapiro 2004). A nice example of this trend is offered by Ernan McMullin (1985). In a characteristically clear and insightful fashion, McMullin highlights the difficulties we face when we attempt to marry the method of the *Principia* with the 'classical empiricism' that has come to characterize the Baconian investigation of nature as follows:

(p. 160) the linking of words to world in the *Principia* is warranted, not in a one-to-one way by means of notions like observation or abstraction, but through the conceptual system taken as a whole. This is, of course, at odds with the empiricist view that the scientist begins by singling out the appropriate observable qualities, and then proceeds to build up inductive generalizations relating them to one another. In this view, the evidence for a generalization such as Hooke's Law would be a specific set of observations. One would then build the science, generalization by generalization (as Bacon advised) until the first principles (that is, the highest generalizations) were ultimately discovered. This is not what Newton did, and the warrant for the *Principia* (and hence for the use of each technical term in it) must be recognized as being of quite a different sort. (McMullin 1985: 47–8)

McMullin lays focus on the systematic nature of the *Principia* and argues that the mechanics presented therein is best viewed through the lens of a 'network model', not a model of induction or deduction. Specifically, and in line with his remarks above, he claims that because the mechanics of the *Principia* must be taken as a whole—where the definitions depend on the laws of nature, the laws of nature depend on the definitions, and neither depend on inductive generalizations in any straightforward sense—we can better appreciate the 'tight and total interconnection' of Newton's definitions, empirical laws, and theoretical presuppositions only if we abandon our attempt to align the *Principia* with 'classical empiricism' (McMullin 1985: 46–7).

I will not here dispute McMullin's characterization of why, from our contemporary standpoint, Newton's *Principia* posed a challenge to the 'classical empiricism' McMullin explicitly associates with Bacon and John Locke. I will, in fact, accept McMullin's claim that Newton's system of mechanics is one that must be considered as a whole and his further claim that the 'Newtonian system stands or falls as a unit' (McMullin 1985: 50). My dispute instead is with McMullin's suggestion that the systematic character of Newton's *Principia* prevents it from being aligned with the 'empiricism' that is characteristic of the Baconian experimental tradition. For, as we notice in the passage above, he adopts a rather narrow view of the empiricism that dominated the seventeenth century. The central tenets of this view are made clear in the opening paragraphs of McMullin's paper:

When I speak of 'classical empiricism,' I have two theses principally in mind. The first of these has to do with *meaning*, specifically how terms derive their meaning from experience. The second concerns the *warrant* appropriate to a scientific hypothesis. The first is associated especially with Locke, the second with Bacon. The

challenge in both cases comes from the unitary character of the theory of motion proposed in the *Principia*. The terms in this theory derive their meaning not from separate experiences of the qualities the terms denote (as Locke would suppose) but from the theory taken as a whole. And the theory itself derives its warrant from its explanatory power when applied as a whole to our observations of moving bodies, not from inductive generalizations supporting each of its constituent ‘laws’ separately, as Bacon’s theory of science might have led one to expect. (McMullin 1985: 33)

(p. 161) Assuming I have said enough at this stage to show that the sort of inductive empiricism that McMullin assigns to Bacon is merely one piece of a broader Baconian programme, the question before us as we turn our attention to the connection between Bacon and Newton is not whether Newton adopted such a method of induction. Rather, given the portrait of Baconianism I have illuminated in the sections above, the question is this: could Baconians such as Sprat and Boyle, who appreciated and promoted the interplay of the ‘experimental’ and the ‘speculative’ parts of natural philosophy, embrace Newton’s work as a part of their own ‘empiricist’ tradition?<sup>11</sup> I offer here an affirmative answer, and I do so because, turning now to the history of philosophy, we have evidence from Locke that Baconians did in fact embrace Newton’s achievement in the *Principia* as a part of their own experimental tradition and did so without relinquishing their core commitment to natural history and experiment.<sup>12</sup>

The Baconian elements of Locke’s account of how best to practise natural philosophy are evident in his *An Essay concerning Human Understanding* (1690), where he states:

In the Knowledge of Bodies, we must be content to glean, what we can, from particular Experiments: since we cannot from a Discovery of their real Essences, grasp at a time whole Sheaves; and in bundles, comprehend Nature and Properties of whole Species together. Where our Enquiry is concerning Co-existence, or Repugnancy to co-exist, which by Contemplation of our *Ideas* we cannot discover; there Experience, Observation, and natural History, must give us by our Senses, and by retail, an insight into corporeal Substances. The Knowledge of Bodies we must get by our Senses, warily employed in taking notice of their Qualities, and Operations on one another. (*Essay* IV. xii. 12)

Other passages from Book Four of the *Essay* also highlight Locke’s commitment to the use of ‘Experience, Observation, and natural History’ in natural philosophy. For instance, a few sections before he offers the passage above, Locke admits that, because our senses cannot grant us insight into the ‘real essences’ of bodies, the ‘empirical’ natural philosophy he promotes cannot carry us towards a demonstrative science (or *scientia*) of natural bodies:

(p. 162) I deny not, but a Man accustomed to rational and regular Experiments shall be able to see farther into the Nature of Bodies, and guess righter at their yet unknown Properties, than one, that is a Stranger to them; But yet, as I have said, this is but a Judgment and Opinion, not Knowledge and Certainty. This *way* of getting, and *improving our Knowledge in Substances only by Experience* and History, which is all that the weakness of our Faculties in this State of *Mediocrity*, which we are in in this World, can attain to, makes me suspect, that natural Philosophy is not capable of being made a Science. (*Essay* IV. xii. 10)

Following the interpretation offered by Anstey, such passages from the *Essay* point to Locke’s commitment to a natural-historical ideal for natural philosophy. As Anstey puts it, Locke accepted the construction of natural histories as *constitutive* of natural philosophy, as a necessary component of any properly practised investigation into nature (Anstey 2002: 68; 2003: 27). If this is correct (and I accept that it is), we face a puzzle when we consider Locke’s endorsement of the *mathematical* approach to nature Newton takes in the *Principia*, as found, for instance, in his correspondence with Stillingfleet. Locke rather boldly claims that Newton’s success has authorized the use of mathematics in our investigations of material things and finds it a ‘great pity that Aristotle had not understood mathematics as well as Mr Newton, and made use of it in natural philosophy with as good success’ (Locke 1823, 4: 427). There are, of course, different strategies for dealing with such remarks. Some scholars have pointed to the natural-historical commitments in the *Essay* as grounds for distancing Locke’s ‘empiricism’ from Newton’s mathematical ‘empiricism’, such that Locke cannot consistently embrace Newton’s method

given the restrictions of his stated epistemology (see DePieris 2006). Others have suggested that, in response to Newton's success, Locke changed his view of natural philosophy and expanded the domain of acceptable modes of investigating nature to include those that are not natural-historical (see Winkler 2008). A further possibility, which I have laid out in greater detail elsewhere (see Domski 2012), is that we can make sense of Locke's simultaneous embracing of Baconian natural history and the Newtonian mathematization of nature by appealing to the different methods assigned to 'experimental' and 'speculative' naturalists. For, if we read Locke's Newton as a 'speculative' naturalist who employed mathematics in his search for natural causes, we gain a portrait that illuminates how Locke could consistently embrace the Baconian methods promoted in the *Essay* and appreciate Newton's achievement in the *Principia*.

In the first instance, it is important to note that Locke very much understood that Newton's treatment of natural motions did not rely on a straightforward inductive method, let alone a natural-historical one. Aside from the comment made to Stillingfleet that highlights the mathematical component of Newton's method, we have in *Some Thoughts Concerning Education* (1693) remarks from Locke that indicate that he is intentionally distinguishing Newton's work from the natural historian's (or, better, the 'experimental' naturalist's) investigation of terrestrial bodies. He writes in section 194:

(p. 163) Though the Systems of *Physicks*, that I have met with, afford little encouragement to look for Certainty or Science in any Treatise, which shall pretend to give us a body of *Natural Philosophy* from the first Principles of Bodies in general, yet the incomparable Mr. *Newton*, has shewn, how far Mathematicks, applied to some Parts of Nature, may, upon Principles that Matter of Fact justifie, carry us in the knowledge of some, as I may so call them, particular Provinces of the Incomprehensible Universe. And if others could give us so good and clear an account of other parts of *Nature*, as he has of this our Planetary World, and the most considerable *Phaenomena* observable in it, in his admirable Book, *Philosophiae naturalis principia Mathematica*, we might in time hope to be furnished with more true and certain Knowledge in several Parts of this stupendous Machin, than hitherto we could have expected. And though there are very few, that have Mathematicks enough to understand his Demonstrations, yet the most accurate Mathematicians, who have examin'd them, allowing them to be such, his Book will deserve to be read, and give no small light and pleasure to those, who willing to understand the Motions, Properties, and Operations of the great Masses of Matter, in this our Solar System, will but carefully mind his Conclusions, which may be depended on as Propositions well proved. (Locke 1989: 248–9, underlining added)

For our present purposes, there are two features of Locke's remarks worth emphasizing: (1) the distinction he draws between Newton's mathematical treatment of the heavens and the systems of physics he has met with thus far, and (2) his claim that Newton's mathematical investigation of the heavens relies on 'principles that matter of fact justifie'. In light of this distinction and this claim, we have good evidence that Locke himself recognized that Newton's was not a natural-historical or straightforwardly 'empirical' project. Newton did ground his analysis of planetary motion on empirical evidence—on 'principles that matter of fact justifie' (and one gathers Locke is referring to Newton's laws of motion). But given the place Locke grants Newton outside the domain of physics, Newton also went beyond a close and careful examination of the evidence collected from 'matters of fact'.

What this 'going beyond' entails is clarified in another work from the same period: the posthumously published *Of the Conduct of the Understanding*. In Section 43 ('Fundamental Verities'), Locke voices his acceptance of universal gravitation and, in so doing, offers us important insight into how he reads Newton's method:

There are fundamental truths that lie at the bottom, the basis upon which a great many others rest, and in which they have their consistency. These are teeming truths, rich in store, with which they furnish the mind, and, like the lights of heaven, are not only beautiful and entertaining in themselves, but give light and evidence to other things, that without they could not be seen or known. Such is the admirable discovery of Mr. Newton, that all bodies gravitate to one another, which may be counted as the basis of natural philosophy; which, of what use it is to the understanding of the great frame of our solar system, he has to the astonishment of the learned world shown; and how much farther it would guide us in other things, if rightly pursued, is not yet known. (Locke 1823, 3: 282)



(p. 164) Notice here that Locke presents universal gravitation as a starting point for understanding nature; he, in fact, deems it ‘the basis of natural philosophy’ and the ‘fundamental truth’ on which Newton’s programme rests. To refer to it as ‘fundamental’ is not to say that it is innate or intuitively known, as would be the case in, say, a Cartesian scheme of natural philosophy. Rather, consistent with the claim made in *Some Thoughts Concerning Education* that Newton’s analysis of planetary motion relies on ‘principles that matters of fact justify’, the suggestion here is that having confirmed through sensory evidence that ‘all bodies gravitate to one another’, Newton establishes universal gravitation as the foundational principle of a system of motion that then gives ‘light and evidence to other things’. In other words, universal gravitation is counted as a fundamental truth of natural philosophy in so far as its acceptance yields a greater understanding of phenomena in the observable world beyond the motion of the heavens.<sup>13</sup>

This point is more clearly made in Locke’s correspondence with Stillingfleet when he reports that he will revise the claim included in the first edition of the *Essay* ‘that bodies operate by impulse, and nothing else’ (*Essay* II. viii. 8):

It is true, I say [at *Essay* II. viii. 8], ‘that bodies operate by impulse, and nothing else’. And so I thought when I writ it, and can yet conceive no other way of their operation. But I am since convinced by Mr. Newton’s incomparable book, that it is too bold a presumption to limit God’s power, in this point, by my narrow conceptions. The gravitation of matter towards matter, by ways inconceivable to me, is not only a demonstration that God can, if he pleases, put into bodies powers and ways of operation above what can be derived from our idea of body, or can be explained by what we know of matter, but also an unquestionable, and every where visible instance, that he has done so. And therefore in the next edition of my book I shall take care to have that passage rectified. (Locke 1823, 4: 467–8, underlining added)

Beyond highlighting the generality of universal gravitation in the above passage, we notice as well that Locke contrasts the notion of gravitation proposed by Newton with what we learn about bodies from our sensory interaction with matter. As he suggests, to claim that bodies share a gravitational attraction is to claim at the same time that ‘God can, if he pleases, put into bodies powers and ways of operation, *above what can be derived from our idea of body, or can be explained by what we know of matter*’ (emphasis added). In other words, Locke suggests that Newton’s analysis of motion begins with a principle of nature—the principle of gravitation—which is not simply derived from what we learn about the properties and qualities of matter from our sensory experience. While there is empirical evidence that supports Newton’s assumption of gravitational attraction, Newton has taken a step beyond what careful observation reveals about those bodies before our senses. He has, in (p. 165) particular, proposed a principle of nature that places these bodies into a certain kind of causal relation and thereby grants us insight into how God may govern these very bodies.

According to this characterization, Newton’s method is most certainly not the method of natural philosophy promoted in the *Essay*, one which deems careful observation and experiment as the essential feature of our investigations into nature. At the same time, this characterization—according to which Newton embraces a foundational and ‘fundamental truth’ in order to understand the ‘great frame of our solar system’—is most certainly not inconsistent with a programme according to which natural history, observation, and experiment are constitutive of natural philosophy. As we saw from both Sprat and Boyle above, there is a place in natural philosophy for the sort of ‘speculation’ Locke associates with Newton so long as ‘the matters be ripe for it’, that is, so long as those pursuing the speculative aims of natural philosophy take care to use the ‘*Principles*, and *Speculations* they now raise from things’ only ‘as a means of farther *Knowledge*’, not as the ‘absolute end’ of investigation (Sprat 1667: 257). For, as Sprat urged, it is only in this way that ‘the most speculative *Notions*, and *Theorems*, that can be drawn from matter, may conduce to much profit’ (Sprat 1667: 257). Locke’s emphasis on the empirical basis of Newton’s work reveals that Newton is proceeding as his ‘Baconian’ predecessors encouraged and envisioned. Newton was not producing conjectures without empirical backing and simply to gain explanatory power; on Locke’s reading, Newton used a principle—the fundamental truth of universal gravitation—that was initially ‘drawn from matter’ and then, with evidence firmly in hand, he extended this principle to a wide store of phenomena. By staying mindful of the proper experimental and evidentiary roots of natural philosophy, Newton thus succeeded in producing the very sort of profit that Sprat and Boyle anticipated a proper ‘speculative’ method could generate.

## 6.5 Conclusion

I began this chapter with reference to the standard story of Bacon's place in seventeenth-century natural philosophy, a story according to which Bacon's unique place in that era is best revealed by contrasting his observational, experimental, and natural-historical method with the logical methods of the Scholastics and the 'rationalist' and mathematical methods of Cartesians on the Continent. I hope that I have said enough to show that a notion of *unity* can in fact better serve us in our attempts to situate Bacon and Baconian natural philosophy in their seventeenth-century milieu, and that it does so precisely because the unity I have (p. 166) attempted to highlight is one which Bacon himself embraced as part and parcel of his programme for natural philosophy. As much as he sought to establish a new way of investigating nature, he recognized that the success of such a project rested, not on simply rejecting what had become misguided modes of investigation, but on reforming those modes so that the sciences could be led back to a common root and brought together in a fruitful way. It is this feature of Bacon's programme that was embraced and extended by Sprat and Boyle, and this feature that ultimately allowed Locke to embrace the mathematical achievement of Newton's *Principia* as part of the Baconian tradition of which he was a part. While Locke's Baconian reading may well fail to exhaust the historical significance and novelty of Newton's method, it does, at the very least, shed important and much needed light on how one can follow Koyré and Kuhn in hailing the *Principia* as the crowning achievement of seventeenth-century natural philosophy without at the same time severing its connections to a Baconian programme—a programme that, as we have seen above, was aimed at bridging the very traditions of seventeenth-century British natural philosophy that historians have too often presented as sharing nothing more than an essential tension.

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## Notes:

(1) Koyré's is certainly an extreme position, though not without influence. See Pérez-Ramos 1988 and Gaukroger 2001 for careful treatments that highlight the novelty and depth of Bacon's proposals.

(2) For examples of Kuhn's influence see Shapin 1988, Dear 1991, and Gaukroger 2001 who describes Kuhn's piece as a 'landmark paper'. Pérez-Ramos 1990 claims that Kuhn offers 'the best analysis to date of the significance' of Baconian science in the seventeenth century.

(3) Kuhn's inclusion of chemistry on the list of Baconian sciences is problematic, because as we now know, due to the work of William R. Newman and others, chemistry was highly developed before Bacon's *New Organon* entered the natural philosophical scene. See Part One of Newman 2006.

(4) For discussion of other non-flattering reactions to Bacon's programme and his impact on British natural philosophy, see Sargent's introduction to Bacon 1999, Sargent 2001, and the Prologue of Gaukroger 2001.

(5) See Gaukroger 2001 for a trenchant treatment of the relationship between the 'idols' of the human mind and scientific enquiry.

(6) For examples of this latter sort of approach we can turn to Galileo's idealized study of free fall and Descartes' geometrical study of optics.

(7) Bacon also emphasizes that the 'excellent use of *the pure Mathematicks*' can 'remedie and cure many defects in the Wit, and Faculties Intellectual' (OFB 4: 88), a point, it seems, overemphasized by Gaukroger, who claims that Bacon 'conceived the usefulness of pure mathematics *exclusively* in terms of helping the concentration' (Gaukroger 2001: 25, emphasis added).

(8) And in this respect, Bacon attempts to *integrate* mathematics into his general programme for natural philosophy, *pace* Gaukroger 2001: 27, who implies that, for Bacon, mathematics stands outside of natural philosophy.

(9) ‘Optimè autem cedit Inquisitio Naturalis, quando Physicum terminatur in Mathematico’, OFB 11: 212. As helpfully pointed out to me by Guido Giglioni, the SEH translation more faithfully captures the Latin meaning of ‘terminatur’ here. The sentence might be literally rendered as: ‘Natural philosophy achieves the best results every time a physical object ends in [or: is converted into] a mathematical one’.

(10) See Domski 2012 for more on Boyle’s connection between the observation of distant objects and the method he assigns the astronomer.

(11) Interestingly, these are the very sort of questions Kuhn was encouraging historians to consider in their respective accounts of seventeenth-century natural philosophy (cf. Kuhn 1977: 34–5). However, as indicated above, it has been his dichotomy between the ‘Baconian’ and ‘classical’ physical sciences that has drawn the greater attention.

(12) As indicated above, McMullin also appeals to Locke in his treatment of Newton’s relationship to ‘classical empiricism’, though his focus is on their respective definitions of ‘body’. My focus will remain on Locke’s account of the method proper to natural philosophy. Also, to be absolutely clear, I am *not* claiming that the reading I attribute to Locke in what follows would have been accepted by Newton himself, and in this regard, I follow in the spirit of McMullin’s treatment of how we should read Newton’s place in the late seventeenth century. For more on Newton’s view of method and his peculiar stance on ‘hypotheses’ and ‘speculation’, see Cohen 1966, Shapiro 2004, and Chapters 4 and 7 in this *Handbook*.

(13) With this we also have evidence that Locke appreciated what McMullin presents as a novel feature of the mechanics of the *Principia* that further separated it from ‘classical empiricism’, namely, its predictive success and expanse of explanation (McMullin 1985: 55–6).

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## The Status of Theory and Hypotheses

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### Abstract and Keywords

This chapter examines the series of drastic epistemological and methodological transformations in the status of hypotheses in British natural philosophy during the seventeenth century. It explains that hypotheses played a rather marginal role in Francis Bacon's methodological thought because he believed they lacked any physical content, although they occupied a centre stage in the Bacon-inspired natural philosophy program of Robert Boyle and Robert Hooke. The chapter mentions that Boyle and Hooke provided a new definition of hypothesis, which is that of something conceived of as causally sufficient and probable explications of natural phenomena that stand in an evidential relation to the natural phenomena they serve to elucidate.

Keywords: hypotheses, natural philosophy, Great Britain, seventeenth century, Francis Bacon, Robert Boyle, Robert Hooke, natural phenomena

NOWADAYS, it is a truism that hypotheses and theories play an essential role in scientific practice. This, however, was far from obvious in seventeenth-century British natural philosophy. Different natural philosophers had different views on the role and status of hypotheses and theories, ranging from fierce promotion to bold rejection, and to both they ascribed varying meanings and connotations. It was a time of epistemological and methodological transformation, in which a clear divide between philosophers and 'scientists' was still absent (see Lüthy 2000).

The guiding idea of this chapter is that, in seventeenth-century British natural philosophy, the terms 'hypothesis' and 'theory' and their cognates were imbedded in a semantic network of interconnected epistemological and methodological notions—such as 'knowledge', 'method', 'probability', 'certainty', 'induction', 'deduction', 'experimental philosophy', 'speculative philosophy', and the like (cf. Anstey 2005: 220–1). As these semantic networks changed over time, the meaning and significance of 'hypothesis' and 'theory' likewise shifted. Without pretence of completeness, this chapter provides a chronological treatment of some of the defining moments in the semantic transformation of these two terms within the context of seventeenth-century natural philosophy (see also Brading 1999).

### (p. 170) 7.1 Bacon: From Particulars to Axioms

Bacon's project of reform was to be founded on 'natural and experimental history', i.e. on a detailed survey of specific phenomena as they occur in the spontaneous course of nature, on the one hand, and on a systematic experimental study of nature 'restrained and vexed' (*naturæ constrictæ et vexatæ*), i.e. nature 'when it is forced from its own condition by human agency, and squeezed and moulded' (OFB 11: 39), on the other.<sup>1</sup> His aim was to arrive, not at pretty and probable

conjectures, but at certain and demonstrable knowledge (*non bellè et probabiliter opinari, sed certò et ostensive scire*) of the interior and remote parts of nature and of the causes or ‘forms’ (*formae*) of things (OFB 11: 52, 70, 112).<sup>2</sup> Once both a natural and experimental history is established, we systematically arrange the information obtained by means of Bacon’s three inductive tables which initiated a process of eliminative induction. Bacon assumed that this process of eliminative induction would continue until one nature remains: ‘a form affirmative, solid, and both true and well defined’ (OFB 11: 255).

According to Bacon, traditional learning was filled with premature theorizing, i.e. with speculation about the causes of things independent of systematic observation—experimentation and eliminative induction. In this context, he frequently used ‘theory’ as synonymous with ‘speculation’, ‘dogma’, ‘doctrine’, or ‘fable’.<sup>3</sup> By contrast, *proper* speculative or theoretical knowledge is knowledge—based on empirical knowledge and established by a methodized process of eliminative induction—about abstract entities, i.e. causes, that are removed from ordinary experience.<sup>4</sup> Bacon divided natural philosophy into a ‘speculative’ (or ‘theoretical’) part and an operative part. The former corresponds to the inquisition of causes (*Inquisitio Causarum*); the latter to the production of effects (*Productio Effectuum*). The speculative part of natural philosophy is in its turn divided into *physica*, which (p. 171) deals with those causes that are transitory (i.e. with efficient and material causes), and *metaphysica*, which deals with those causes that are abstract and fixed (i.e. with final causes and the forms of things) (SEH 2: 264; OFB 4: 80–8). ‘Physic’ is based on natural history and stands between natural history and ‘metaphysic’, which is in its turn based on natural history and ‘physic’. Natural history describes the variety of things; ‘Physic’ their variable causes; and ‘Metaphysic’ their fixed and constant causes so that each higher-level branch of knowledge entails a higher degree of abstraction (OFB 4: 82).<sup>5</sup> According to Bacon, ‘speculative’ knowledge, i.e. knowledge about causes, is the outcome of a gradual and methodized process of generalization and increasing abstraction from the immediate information provided by the senses. Bacon did not see proper speculative knowledge as antithetical to observational-experimental knowledge; rather he saw proper speculative knowledge as the methodized outcome of observational-experimental knowledge (Anstey 2005: 216–17).

Bacon closely associated ‘hypotheses’ with specific mathematical models in astronomy. According to Bacon, defenders of such astronomical models do not assert anything actually true of celestial bodies, but merely seek to introduce some mathematical rules that are convenient for calculations and the construction of astronomical tables (OFB 6: 112, 134, 190). According to Bacon, astronomical hypotheses, which he considered as mathematical constructions ‘quite devoid of substance’ (OFB 6: 149), do not belong to natural philosophy because they do not deal with the physical reasons or causes of celestial motion (OFB 6: 186; SEH 2: 134, 264, 286; 5: 444). Physical astronomy should aim not only at calculation and prediction, but at a natural-philosophical treatment of the celestial bodies: a treatment, not of ‘what is accordant with phenomena, but of what is found in nature and is actually and really true’, or, in other words, a treatment of ‘their substance, various qualities, powers, and influences, according to natural and certain reasons’ (OFB 6: 110). Bacon’s stance on astronomical hypotheses has an important implication: when he observes that both the Ptolemaic and the Copernican<sup>6</sup> system (and, for that matter, alternative mathematical ‘constructions’ that might save the same phenomena) are equally compatible with phenomena (OFB 4: 92; 6: 110; SEH 7: 75), he is not at all asserting that astronomical hypotheses are *physically* underdetermined, since for him they are purely *mathematical*.

## (p. 172) 7.2 Boyle and Hooke: The Fruitfulness of Framing Hypotheses

Undoubtedly, it is correct to claim that Bacon’s call for the systematic collection of natural and artificial histories, which were to form a sound foundation for establishing proper theoretical superstructures, was a key source of inspiration for the founding Fellows of the Royal Society of London (Hunter 1989). However, rather than providing a definite exposition of the specific precepts of use in natural-philosophical enquiry, Bacon’s philosophy served as ‘a *general programme* into which a whole range of particular ideas from other sources could fit’ (Hunter 1981: 17, emphasis added)—thereby leaving considerable room for methodological elaboration, innovation, and to some extent selectivity. In this context, the integration of physical hypotheses in natural philosophical enquiry, which was coextensive with the emergence of a probabilistic view of

human knowledge in between dogmatism and radical scepticism (Sprat 1667: 101), should be seen as a substantial and original extension to Bacon's plan of methodological reform. As we have seen in the previous section, Bacon commented rather sparingly on the details of his two *scalae*. Generations after Bacon had to fill in this lacuna for themselves (cf. Shapiro 1983: 49).<sup>7</sup> In doing so, natural philosophers came to ascribe a crucial role to hypotheses in physical enquiry, as the work of Robert Boyle and Robert Hooke particularly testifies. Both Boyle and Hooke conceived of hypotheses, which they used synonymously with 'theories', as *causally sufficient and probable* 'explications' of natural phenomena that stand in an evidential relation to the matters of fact they serve to elucidate.

### 7.2.1 Boyle: Hypotheses as Explications

In line with Bacon's programme of reform, the self-acclaimed 'underbuilder' of physico-mechanical philosophy and promoter of a 'grand Design of promoting Experimental and Useful Learning' (*Spring of the Air* (1660), B 1: 143),<sup>8</sup> Robert Boyle, observed that natural philosophers have 'too hastily, and either upon a few Observations, or at least without a competent number of Experiments, presum'd to establish Principles, and deliver Axioms' (*Certain Physiological Essays* (p. 173) (1661), B 2: 13, 20).<sup>9</sup> Rather than collecting a body of natural and experimental history on the basis of which 'a Solid Theory may be safely built' (B 4: 58), and examining 'how far the Phænomena are, or are not, capable of being salv'd' by a particular hypothesis, speculative philosophers have been 'over-forward to establish Principles and Axioms' (B 2: 14) and have 'been wont either wholly to neglect Experiments or, if conspicuous ones have been, (as it were) *obtruded* upon them, have rather *accommodated* them (and too often *wrested* them) to their <already framd> Theory's, than *regarded* them in the framing of their Theory's: and in a word, have look'd upon them as things, that a speculative wit may, if he please, *Adopt*, but do's not *Heed*' (B 13: 352–3). The Aristotelians and the School-philosophers make 'but little use of Experience; contenting themselves for the most part to employ but few and obvious Experiments, and vulgar Traditions, usually Uncertain, and oftentimes False; and superstructing almost their whole Physicks upon *Abstracted Reason*' (B 11: 292; cf. 307). Moreover, rather than enlightening natural phenomena, they introduce 'Principles readily nam'd, but scarce so much as pretended to be understood' (B 8: 86; cf. B 3: 246; 8: 104) and 'have their recourse to [Spiritual] Agents [i.e. substantial Forms and real Qualities] that are not onely invisible, but inconceivable', whereas 'betwixt visible bodies and Spiritual Beings there is a middle sort of Agents, invisible Corpuscles; by which a Great part of the difficulter *phaenomena* of Nature are produc'd, and by which may intelligibly be explicated those *Phænomena*' (B 6: 167). The arguments of mechanical philosophers are founded on intrinsically intelligible notions, such as '*Local Motion, Rest, Bigness, Shape, Order, Situation, Contexture* of Material Substances' (B 8: 105). *Virtuosi* also make

much greater and better use of Experience in their Philosophical Researches. For they consult Experience both frequently and heedfully; and, not content with the *Phænomena* that Nature spontaneously affords them, they are solicitous, when they find it needful, to enlarge their Experience by Tryals purposely devis'd; and ever and anon Reflecting upon it, they are careful to Conform their Opinions to it; or, if there be just cause, Reform their Opinions by it. (B 11: 292; cf. 304)

A hypothesis, Boyle writes, is 'a *supposition* (whether true or fals) that men have pitchd upon, or devis'd, as a Principle, <by> whose help the phaenomeno[n] wherto it is to be applyd may be *explicated*, that is <clearly deducd from causes> understood'. Furthermore, a hypothesis

ought to be more clear & known than the *phaenomena* it is to explain & if it be not intelligible when proposd, it cannot but be useless when applyd, <And> to <go about> (p. 174) to illustrate the obscure transactions of nature, by an obscure hypothesis, is as improper as to attempt to <shew> a man <his way> in the dark <with> an unlighted torch. (B 13: 271–2)

In similar vein, in his *Mechanical Origin of Qualities* (1675–1676), Boyle stated that the aim of a hypothesis is 'to render an intelligible account of the Causes and the Effects or Phænomena propos'd, without crossing the Laws of Nature or other Phænomena' (B 8: 325). '[T]he more numerous', Boyle added, 'and the more various the Particulars are, whereof some are



*explicable* by the assign'd Hypothesis, and some are *agreeable* to it, or at least are not dissonant from it, the more valuable is the Hypothesis, and the more likely to be true' (B 8: 325).

Explications of natural phenomena cannot be established a priori (B 8: 114–5)<sup>10</sup> and, rather than demonstrative certainty, they offer moral certainty (B 8: 66; cf. B 8: 345).

Moreover, there is no guarantee that 'many things may be discover'd in After-times by Industry or Chance, which are not now so much as dream'd of, and which may yet overthrow Doctrines speciously enough accommodated to the Observations that have been hitherto made' (B 8: 89). Boyle conceived of hypotheses as temporary 'superstructures', which 'though they may be preferr'd before any others, as being the least imperfect, or, if you please, the best in their kind that we yet have, yet are they not entirely to be acquiesced in, as absolutely perfect, or incapable of improving Alternations' (B 2: 14). It is in light of this that we should consider Boyle's endorsement of the 'Corpuscularian Hypothesis' (see Clericuzio 1990; Newman 1994, 1996): he did not conceive of corpuscularianism as an established theory, but as the best, i.e. most fertile or heuristically valuable (Anstey 2002), generally applicable, and intelligible hypothesis of natural phenomena *virtuosi* have hit upon (cf. Sargent 1986: 475–6; Chalmers 1993: 547; Chalmers 2010: 7–8; Newman 2010: 208–9).<sup>11</sup> According to Boyle, the requisites of a *good hypothesis* are that (i) it is intelligible; (ii) it contains nothing impossible or manifestly false; (iii) it does not suppose anything unintelligible, impossible, or absurd; (iv) it is self-consistent; (v) it is 'fit & Sufficient to Explicate the *Phaenomena*, especially the chief'; and (vi), it is 'at least Consistent with the rest of the *Phaenomena* it particularly relates to, & do not Contradict any other known *Phaenomena* of Nature, or manifest Physical Truth' (S: 119). The requisites of an *excellent hypothesis*, furthermore, are that (i) it is 'not Precarious, but have sufficient Grounds in the nature of the Thing it self, or a lest be well recommended by some Auxiliary Proofs'; (ii) it is 'the Simplest of all the Good ones we are able to frame, at lest Containing nothing tht is Superfluous or Impertinent'; (iii) it is 'the (p. 175) only Hypothesis tht Can explicate the *Phaenomena*, or at lest that does explicate them so well'; (iv) it enables 'a skilful Naturalist to Foretell Future *Phaenomena*, by their Congruity or Incongruity to it: and especially the Events of such Expts as are aptly devised to Examine it; as Things tht ought or ought not to be Consequent to it' (S: 119; Hall 1965: 134–5). According to Boyle's own standards, the corpuscularian hypothesis will easily pass as a good hypothesis and perhaps even as an excellent hypothesis. It will, however, not satisfy the first, and most rigid, disjunct of the third *desideratum* for an excellent hypothesis. Because of causal underdetermination, mechanical explanations offer only a sufficient but not a necessary and sufficient account of physical effects (B 3: 255; cf. B 8: 322).

Just as Bacon had done, Boyle reserved a place for proper speculative or theoretical natural philosophy. In a manuscript from c. 1666, Boyle indicated that the practical or experimental part of natural philosophy, in which the production of effects occupies centre stage, and the speculative part, which addresses the causes of things, might engage in what he considered as a 'happy Marriage'. The practical or experimental part might assist 'the speculative Phylosopher, that is solicitous about the causes and reasons of Naturall things' and 'the speculative Phylosopher so assisted, may (on the other side) very much improve the Practical part of Physick' (B 13: 351; cf. Boyle 2001, 3: 170). Elsewhere, Boyle was more explicit about this mutual interaction: on the one hand, experimentation was useful to speculative philosophy in that it could: (i) supply and rectify the senses, (ii) suggest hypotheses 'both more general and particular', (iii) illustrate explications, (iv) determine doubts, (v) confirm truths, (vi) confute errors, and, (vii) hint to 'luciferous inquiries and experiments' and contribute 'to the making them skilfully'; on the other hand, speculative philosophy is useful to experimentation in that it allows for: (i) devising 'philosophical experiments, which depend only, and mainly, upon Principles, notions, and Ratiocinations' and (ii) 'instruments both mechanical and others to make inquiries and tryalls with', (iii) varying and improving known experiments, (iv) helping 'to make estimates of what is physically possible and practicable', (v) foretelling 'the events of untried experiments', (vi) ascertaining 'the limits and causes of doubtful and seemingly indefinite experiments', and, (vii) determining 'accurately the circumstances and proportions, as weight, measures and duration etc. of experiments' (BP 9: f. 30v; quoted from Sargent 1995: 164). However, rather than seeing the speculative part of natural philosophy as the eventual outcome of the historical part, as Bacon did, Boyle seemed to stress that both were in continuous interaction.

### 7.2.2 Hooke: From Hypotheses to True Axioms

‘*The truth is*’, Robert Hooke (1635–1703) lamented in the preface to the *Micrographia* (1665), ‘*the Science of Nature has been already too long made only a work of the* (p. 176) *Brain and the Fancy: It is now high time that it should return to the plainness and soundness of Observations on material and obvious things*’ (Hooke 1665: sig. b1). By endorsing an inadequate method of enquiry, pre-Baconian natural philosophy has established probabilities only, rather than certainty (Hooke 1705: 107). Natural philosophers who endorse the traditional way of studying nature have promoted several misguided practices, most notably: they have failed to distinguish between what is true, probable, and false (Hooke 1705: 4);<sup>12</sup> being inclined to ‘Speculation and abstracting’ (Hooke 1705: 4, 8, 10), they have proceeded to ‘the most General and Universal Conclusions and Theories’ from ‘a very few uncertain Histories’;<sup>13</sup> they have adapted experiments and observations to their hypotheses rather than regulated ‘their Thoughts by them, esteeming their own Understandings to be the Mine of all Science’ (Hooke 1705: 4); where rectification of a hypothesis is required, they have introduced additional ad hoc hypotheses rather than ‘renewing or Amending the whole’; and, they have relied on syllogism so that ‘their Axioms and conclusions cannot be better than the grounds and Principles from which they were rais’d’ (Hooke 1705: 5). In line with the Royal Society programme of natural-philosophical reform, Hooke sought to

*proceed from the real, the mechanical, the experimental Philosophy, which has this advantage over the Philosophy of discourse and disputation, that whereas that chiefly aims at the subtilty of its Deductions and Conclusions, without much regard to the first ground-work, which ought to be well laid on the Sense and Memory; so this intends the right ordering of them all, and the making them serviceable to each other.*  
(Hooke 1665: sig. a3)

Correspondingly, Hooke sought ‘to raze the old Pile built upon unstable Fancies and unsound opinions, and to begin a new upon a sure Foundation of Experiments’ (Hooke 1661: 43), and, rejected ‘*Dogmatizing*, and the *espousal* of any *Hypothesis* not sufficiently grounded and confirm’d by *Experiments*’ (Hooke 1665: sig. A4; cf. sig. g1) and ‘pre-conceived Theories and Deductions from particular, and seemingly accidental Experiments’ (Hooke 1705: 280). By reforming philosophy, Hooke remarked,

*[t]alking and contention of Arguments would soon be turn’d into labours; all the fine dreams of Opinions, and universal metaphysical natures, which the luxury of subtil Brains has devis’d, (p. 177) would quickly vanish, and give place to solid Histories, Experiments and Works.* (Hooke 1665: sig. b3)

The aim of natural philosophy, according to Hooke, is ‘to find out a *perfect Knowledge* of the Nature and Properties of Bodies, and of the *Causes of Natural Productions*, and this Knowledge is not barely acquir’d for it self, but in order to the inabling a Man to understand how by the joyning of fit Agents to Patients according to the Orders, Laws, Times and Methods of Nature, he may be able to produce and bring to pass such Effects, as may very much conduce to his well being in this World’—hereby Hooke was clearly echoing Bacon’s causal and utilitarian programme of reform (Hooke 1705: 3, italics added; cf. Hooke 1705: 330). According to Hooke, natural philosophers will in the long run (Hooke 1705: 35, 70) be able to provide ‘a certain Theory’ of ‘the inward Texture and Constitution’ of bodies and their ‘Internal Motions, Powers and Energies’ (Hooke 1705: 3, 61; see Wilson 1995) on the basis of a substantial body of natural and experimental history: ‘though the Operations of Nature are more secret and abstruse; and hid from our discerning ... yet it seems most probable, by the Effects and Circumstances; that most of them may be capable of Demonstration and Reduction to a certain Rule, as the Operations of Mechanicks or Art’ (Hooke 1705: 19–20).

Hooke was not only an ‘inquisitive naturalist’, he also reflected on natural-philosophical method—albeit that he never finished a systematic and complete account on this topic (see Hesse 1966; Hunter 2005; Oldroyd 1972, 1987). Hooke’s most detailed, but still rather sketchy and incomplete, exposition of his thoughts on natural-philosophical method can be found in his *A General Scheme, or Idea of the Present State of Natural Philosophy* (c. 1666) which was published posthumously (Hooke 1705: 1–70). In what follows, I will combine material taken from the *General Scheme* with several of Hooke’s later methodological asides as found among his manuscripts and natural-philosophical works proper. In order to address Hooke’s methodology, it is useful to consider the seven consecutive stages of natural-philosophical enquiry he spelled out in a

manuscript dating from 1689. The first three stages are:

[1] Either <first> to define and Reduce to a <geometricall> certainty the Powers and effects <of Naturall bodys> already in part known, by Stating and Limiting them And their proper extents according to Number Weight and Measure

[2] or Els Secondly to Discover some new propriety's Qualifications or powers of Bodys not before taken notice of, by meanes of whereof there might be Administred to an inquiring Naturalist A new medium or meanes to Discover the true essence and Nature of that body

[3] Or thirdly to invent and Exhibit some new artificiall ways and Instruments to inable such as should think fitt to use them, to make more curious and deeper searches into the nature of Bodys and their Operations. (Royal Society Classified Papers, 20, no. 77; quoted from Hunter 2005: 107, numeration added)

(p. 178) In the first stage, empirical givens are quantified, measured, and 'reduced to Regularity, Certainty, Number, Weight, and Measure; for whereas in the common ways of Ratiocination, Examination and Inquiry, all things are trusted to the immediate Power of the Faculties of the Soul, viz. the bare Senses, Memory and Reason' (Hooke 1705: 34). In the second stage, a 'Philosophical History', i.e. 'a brief and plain Account of a great Store of choice and significant Material and Artificial Operations, Actions and Effects, ranged in a convenient Order', is collected. Hooke stressed that, until the collected 'Philosophical History' is 'pretty much stored with choice and sound Materials, the Work of raising new Axiomes or Theories is not to be attempted, lest beginning without Materials, the whole Design be given over in the middle, for out of this are to be taken the Foundation Stones, on which the whole Structure should be raised' (Hooke 1705: 18). In order to remedy the imperfections of the human mind, Hooke proposed a 'Hypothetical Scepticism', whereby we impose upon ourselves a disbelief of all statements 'that we have already inbraced or taken as a Truth' and only to accept them again after 'weighing well all the Arguments and Circumstances that can be alleg'd either for or against them by many Tryals and Experiments and Siftings ... distinctly and determin'd as can produce sufficient *Evidence of Truth*' (Hooke 1705: 11, italics added) and prescribed the use of instruments to assist the senses (Hooke 1665: sig. a3–4, c4, 116). For Hooke *empirical evidence* clearly was the benchmark of proper knowledge. Correspondingly, Hooke defined knowledge 'in the highest *Idea* of it' as 'a certainty of information of the Mind and Understanding founded upon true and undeniable Evidence'. 'True and undeniable Evidence', he continued, 'is afforded either immediately by the *Sense* without Fallacy, or mediately by a true Ratiocination from such Sense' (Hooke 1705: 330–1). The four stages that follow are:

[4] Or 4<sup>ly</sup> to invent and search out, by a proper <Synthetick> method of Reasoning from effects to causes such theorys as to me seemed capable to give Instructive Direction for further Examination by experiments, such consequences as by Analyticall Resolution seemd to be the necessary Results of such a theory and conclusion

[5] Or in the 5th place to proceed with the <further> examination of such Experiments in order to the confirmation of the Doctrine propounded if they answered In all particulars to the effects that were expected or to the Amending Limiting and further Restraining therof if somewhat new and not expected occurred thereupon

[6] Or sixtly to Collect such Observations as are Recorded in Naturall Historians and philosophick writers as might give farther confirmation or information concerning the present Inquiry

[7] Or seaventhly to produce such geometricall Demonstrations of asserted propriety's as put the Doctrine beyond further Dispute. (Royal Society Classified Papers, 20, no. 77; quoted from Hunter 2005: 107, insertion of numbers added)

(p. 179) According to Hooke, the two methods of attaining certain knowledge are the 'Analytick method', which proceeds deductively 'from the Causes to the Effects', and the 'Synthetick method' which ascends inductively<sup>14</sup> 'from the Effects to the Causes'<sup>15</sup>:

The former is the more difficult, and supposes the thing already done and known, which is the thing sought and to be found out; this begins from the highest, most general and universal Principles or Causes of Things, and branches itself out into the more particular and subordinate. The second is the more proper for experimental

Inquiry, which from a true information of the Effect by a due process, finds not [*sic*; misprint for 'out'] the immediate Cause thereof, and so proceeds gradually to higher and more remote Causes and Powers effective, founding its Steps upon the lowest and more immediate Conclusions. (Hooke 1705: 330)

In natural-philosophical enquiry the synthetic method, which proceeds from particulars to general principles, is to be continuously assisted by the analytic method:

Now tho' in Physical Inquiries, by reason of the abstruseness of Causes, and the limited Power of the Senses we cannot thus reason, and without many Inductions from a multitude of Particulars come to raise exact Definitions of things and general Propositions; yet by comparing of varieties of such Inductions we may arrive to so great an assurance and limitation of Propositions as will at least be sufficient to ground Conjectures upon, which may serve for making *Hypotheses* fit to be enquired into by the *Analytick* method, and thence to find out other Experiments or Observations are necessary to be procured for the further progress in the *Synthetick*, which will questionless so far inform us of the general and universal progress of the Operations of Nature, that nothing but what is really the truth shall be proposed but the absurdity and insufficiency thereof will presently be detected and proved. (Hooke 1705: 331)

The idea is that the initial inductions established from phenomena by the 'Synthetick' method—note that, at this point, the synthesis is not yet completed: the cause of the phenomena at hand is not yet determined—will provide or suggest<sup>16</sup> propositions 'sufficient to ground Conjectures upon' (stage 4) which are subsequently tested by the 'Analytick' method, i.e. it will be ascertained whether 'from an Hypothesis being supposed or a premeditated Design, all the *Phænomena* of the (p. 180) Subject will be *a Priori* foretold, and the Effects naturally follow as proceeding from a Cause so and so qualified and limited' (Hooke 1705: 330). In the analysis we thus establish whether a hypothesis is able 'to solve all phenomena' (stage 5). For, as Hooke noted, 'we are only ascertain'd of y<sup>e</sup> truth or certainty of any axiome merely by the information receiv'd from y<sup>e</sup> senses' (quoted from Oldroyd 1980: 19). The analytic method, which proceeds hypothetico-deductively, offers a powerful tool to eliminate hypotheses: 'the *Synthetick* way by Experiments and Observations, &c. will be very slow if it be not often assisted by the *Analytick*, which proves of excellent use, even tho' it proceed by a false position; for that the discovery of a *Negative* is one way of restraining and limiting an *Affirmative*' (Hooke 1705: 330). If a hypothesis is confirmed empirically it is retained and awaits further investigation (cf. stage 7). Hooke closely associated the analytic method to the propounding of 'Queries', i.e. specific research questions the inquisitive naturalist seeks to settle by empirical means (Hooke 1705: 331).<sup>17</sup> Such 'Queries' are accompanied by a specification of those observations or experimental outcomes that would answer the question at stake, i.e. a natural philosopher is to specify 'what Observations, Examinations, or Experiments would seem conducive thereunto, and accordingly under every such Query of Question, he ought to set down the things requisite to be known for the obtaining the full Knowledge of a compleat and full Answer to it' (Hooke 1705: 28), on the one hand, and the 'Instruments, Engines, and Contrivances' by which they could be produced, on the other (Hooke 1705: 33). With respect to the sixth stage, Hooke recorded that by consulting the opinions of received hypotheses and theories on the phenomena at hand and by familiarizing ourselves with their proceedings and ratiocinations, 'the Mind will, by being acquainted with various Conjectures and Solutions of things, be much sooner and better freed from Prejudice; for by discovering experimentally the Errors in this or that Hypothesis, 'twill be much easier taken off from adhering to any, and so enjoy a greater Freedom of perceiving and imbracing Truth' (Hooke 1705: 19, cf. 69–70). In the final stage the hypothesis that accounts for all phenomena is established as certain by mathematical demonstration—the specifics on how this is to be performed are lacking.

Hooke openly embraced the use of hypotheses in natural philosophy: hypotheses, which he, like Boyle, did not systematically distinguish from theories, had pedagogical and heuristic value (see Boyle to Oldenburg, 13 June 1666, Boyle 2001, 3: 171). The fact that hypotheses were used in the process of theory construction did not mean, for Hooke, that the final result would remain conjectural: by systematically exploring and testing hypotheses, including potentially false ones, true axioms are established eventually (Oldroyd 1987: 162).

## (p. 181) 7.3 The Method of Hypotheses: Taking Stock

In Boyle's and Hooke's methodological reflections we can trace an important evolution in the concept of hypothesis: while Bacon associated hypotheses primarily with purely mathematical descriptions of (astronomical) phenomena, Boyle and Hooke conceived of hypotheses as physical and causal 'explications' of phenomena that are grounded on empirical evidence. The method of hypothesis, as promoted by Boyle and Hooke, put two important questions on the agenda of later generations of natural philosophers: (1) *(how) can we license transductive inferences, given the fact that the constituting micro-parts of macroscopic bodies are unobservable?* (= the question of transduction), and, (2) *what are we to make of the conclusiveness of the demonstrations in natural philosophy, given the fact that they are based on causal sufficiency?* (= the question of sufficiency). To come to terms with these issues, two significant positions were developed: a critical-philosophical one (Locke) and a natural-philosophical one of methodological reform (Newton).

## 7.4 Locke's Reservations Concerning the Method of Hypotheses and Transduction

*'[T]he Age we live in, is not the least knowing'*, John Locke (1632–1704) noticed in 'The Epistle to the Reader' to his *Essay concerning Human Understanding* (1690). While Master-Builders such as Boyle, Sydenham, Huygens, and 'the incomparable Mr Newton' have advanced the sciences, Locke saw himself employed as 'an Under-Labourer in clearing Ground a little, and removing some of the Rubbish, that lies in the way to Knowledge', i.e. in examining 'the Extent of humane Knowledge' and our abilities of knowing. If men extend 'their Enquiries beyond their Capacities', and let 'their Thoughts wander into those depths, where they can find no sure Footing', 'tis no Wonder, that they raise Questions, and multiply Disputes, which never coming to any clear Resolution, are proper only to continue and increase their Doubts, and to confirm them at last in perfect Scepticism'. Accordingly, Locke proposed a 'Historical, plain Method', by which both the ways in which we acquire the notions we have and their grounds and certainty are scrutinized (*Essay* I. i. 2). Our knowledge, although it can progress, cannot exceed our ideas 'either in extent, or perfection' (*Essay* IV. iii. 6). According to Locke, *Knowledge* is 'the perception of the connexion and agreement, or disagreement and repugnancy of any of our Ideas' (p. 182) (*Essay* IV. i. 2). *Knowledge* comes in three kinds: *Intuitive Knowledge*, i.e. the perception of the (dis)agreement of two ideas compared with each other, and *Demonstrative Knowledge*, i.e. the perception of the (dis)agreement of two ideas by the intervention of other ideas, and *Sensitive Knowledge*, i.e. the perception by our senses of things external to us (*Essay* IV. ii. 14). Intuitive and demonstrative knowledge are certain. Sensitive knowledge goes 'beyond bare probability', but does not yet reach perfectly 'to either of the foregoing degrees of certainty'. If *Knowledge* is lacking, only *Judgement*, i.e. 'the putting *Ideas* together, or separating them from one another in the Mind, when their certain Agreement or Disagreement is not perceived, but *presumed* to be so', is at hand (*Essay* IV. xiv. 4; cf. IV. xv. 4). *Judgements* are predicated under *Probability* (or 'likeness to be true') which is 'nothing but the appearance of such an Agreement, or Disagreement, by the intervention of Proofs, whose connexion is not constant and immutable [i.e. certain], or at least is not perceived to be so, but is, or appears for the most part to be so, and is enough to induce the Mind to *judge* the Proposition to be true, or false, rather than the contrary' (*Essay* IV. xv. 1). In the context of natural philosophy, a *hypothesis*, for Locke, is a *conjecture which postulates unobservable entities in order to explain processes, events, or changes in the observable macro-world*.

In order to contextualize Locke's reservations concerning hypotheses, it is crucial to understand the well-known metaphysical distinction Locke introduced between primary and secondary qualities and especially the role played therein by the corpuscular hypothesis.<sup>18</sup> Primary or original qualities are those qualities in bodies that are 'utterly inseparable from the Body, in what estate soever it be' (i.e. solidity, extension, figure, and mobility); secondary qualities are those qualities that produce 'various Sensations in us by their *primary Qualities*' (i.e. colour, sound, taste, etc.) (*Essay* II. viii. 9–10). Humans do not have epistemic access to the primary qualities of the insensible parts of bodies: because our senses fail us 'in the



discovery of the Bulk, Texture, and Figure of the minute parts of Bodies, on which their real Constitutions and Differences depend, we are fain to make use of their secondary Qualities' (*Essay* II. xxiii. 8; cf. III. vi. 9, 13). Since we have no knowledge beyond experience, we cannot know 'the internal Constitution, and true Nature of things, being destitute of Faculties to attain it' (*Essay* II. xiii. 32). With respect to real essences we are 'incurably ignorant' (*Essay* IV. vi. 5). The primary qualities of bodies are 'too subtile to be perceived' in practice (*Essay* IV. ii. 11; see Downing 1992). Although we are 'not without *Ideas* of these primary qualities of Bodies in general, yet not knowing what is the particular *Bulk*, *Figure*, and *Motion*, of the greatest parts of the Bodies of the Universe, we are ignorant of the several Powers, Efficacies, and Ways of Operation, whereby the Effects, which we daily see, are produced' (*Essay* IV. iii. 24). Long before the publication of the (p. 183) *Essay*, Locke had expressed his scepticism about humans' ability to know 'the contrivances by which nature works' in his medical essay 'Anatomia' (1668). There he noted that 'after all our porings and mangling the parts of animals we know nothing but the gross parts, see not the tools and contrivances by which nature works' (Dewhurst 1963: 87) and that the small particles in nature are so fundamentally insensible 'that I thinke noe body will ever hope or pretend, even by the assistance of glasses or any other invention, to come to a sight of them' (Dewhurst 1963: 85). Similarly, in Draft A of the *Essay* (1671), Locke wrote that 'I have noe knowledg of the *modus operandi*, the way how these effects are produced ... because these alterations being made by particles soe small & minute that they come not within the observation of my senses' (Locke 1990: 31). For Locke, asserting that humans do not have epistemic access to the original qualities of things is equivalent to stating that humans cannot know the *real essences* of things, i.e. 'the real Constitution of Substances' on which the epistemologically accessible *nominal essence* depends (*Essay* III. vi. 2). Nominal essences refer to collections or 'bundles' of ideas of secondary qualities that have been found to coexist in substances of the same kind (*Essay* III. ix. 13; III. iii. 20). In so far as natural philosophy attempts to unravel the inner constitutions of things it is speculative, i.e. it goes beyond the things to which we have epistemic access (*Essay* IV. xxi. 2). Given Locke's frequent corpuscular talk when discussing the primary qualities, many scholars have claimed that atomism was the foundation on which the *Essay* was built (Mandelbaum 1964). Careful scrutiny, however, provides a more nuanced reading: when talking about the primary qualities in corpuscularian terms, Locke was not committing himself to corpuscularianism, rather he used it to illustrate the difference between primary and secondary and to clarify the notion of 'real essence'.<sup>19</sup> Locke often explicitly distanced himself from the corpuscularian hypothesis:

I have here instanced in the corpuscularian Hypothesis, as that which is thought to go farthest in an intelligible Explication of those Qualities of Bodies; and I fear the Weakness of humane Understanding is scarce able to substitute another, which will afford us a fuller and clearer discovery of the necessary Connexion and *Co-existence*, of the Powers, which are to be observed united in several sorts of them. This at least is certain, that which ever Hypothesis be clearest and truest, (for of that it is not my business to determine,) our Knowledge concerning corporeal Substances, will be very little advanced by any of them, till we are made see, what Qualities and Powers of Bodies have a *necessary Connexion or Repugnancy* one with another, which in the present State of Philosophy, I think, we know but to a very small degree: And, I doubt, whether with those Faculties we have, we shall ever be able (p. 184) to carry our general Knowledge (I say not particular Experience) in this part much farther. (*Essay* IV. iii. 16, underlining added)

In *Essay* IV. ii. 11, Locke cautioned that 'I do not say, that the nature of Light consists in very small round Globules; nor of Whiteness, in such a texture of parts as gives a certain Rotation to these Globules, when it reflects them; for I am not now treating physically of Light, or Colours'. Locke granted that the corpuscular hypothesis is intelligible and explanatory, since it postulates microscopic bodies analogous in their interaction to the macro-level bodies that we can observe. The corpuscularian hypothesis is what Locke considered as an 'analogy', i.e. a transference of causal structures that hold between observable objects to unobservable objects (Anstey 2003: 30). In a note dated on 26 June 1681, Locke noted that 'the knowledge of natural bodys and their operations reaching litle farther then bare matter of fact without haveing perfect Ideas of the ways and maners they are produced nor the concurrent causes they depend on'. '[B]ut', Locke continued, 'a man is principally helped in them by the history of matter of fact and sagacity of enquireing into probable causes and findeing out an analogie in their operations and effects' (Locke 1936: 117). In these matters, analogy is 'the only help we have, and

'tis from that alone we draw all our grounds of Probability' (*Essay* IV. xvi. 12). In the end, however, Locke rigidly distinguished a hypothesis' intelligibility from its truth—and in that sense the *Essay* contained a pertinent criticism to the programme of Boyle and Hooke.

Because of Locke's characteristic stress on human ignorance and probability, his epistemology came under attack by the Aristotelian philosopher John Sergeant. Sergeant defended the view that science can only be attained by making the notions which we receive from experience clear and distinct and dividing them according to their 'intrinsic differences' so that 'first principles', i.e. definitions of these notions that capture their essences, are established from which infallible and certain conclusions are derivable by syllogistic reasoning (Sergeant 1696: 5, 228, 251, 256). Thereby Sergeant railed against the 'Speculative Philosophers', 'who pretend to proceed by Reason and Principles', and the 'Experimental Philosophers', who proceed by induction (Sergeant 1696: [sig. b6<sup>f-v</sup>]). Sergeant also rejected moral certainty, which he considered to be mere uncertainty or 'Mock-Certainty' (Sergeant 1696: 351–[3]). Ultimately, Sergeant considered all science not attained by the method he prescribed as hypothetical: 'Hypothetical Philosophy, which is grounded on Suppositions; and *beggs* that such and such things may be yielded and then it will explicate all Nature, is built on *meer Fancy*, and is unworthy the name *Philosophy*' (Sergeant 1696: 172).

Whereas Boyle had stressed the happy marriage between the practical and the speculative part of natural philosophy and whereas Hooke had claimed that by exploring and testing hypotheses true axioms will arise eventually, Locke was—given the epistemology he developed in the *Essay*—more sceptical about the (p. 185) usefulness of hypotheses in (natural) philosophy (cf. Yost 1951 and Anstey 2003). In the chapter entitled *Of the Improvement of our Knowledge*, Locke emphasized 'how little general Maxims, precarious Principles, and Hypotheses laid down at pleasure, have promoted true knowledge' (*Essay* IV. xii. 12). In a letter to Molyneux in 1697, Locke wrote that he had always thought 'that laying down, and building upon hypotheses, has been one of the great hindrances of natural knowledge' (Locke to Molyneux, 15 June 1697, Locke 1976–1989, 6: 144). Locke, however, granted that hypotheses 'if they are well made, are at least great helps to the Memory, and often direct us to new discoveries', but he cautioned that 'we should *not take up any one too hastily*, (which the Mind, that would always penetrate into the Causes of Things, and have Principles to rest on, is very apt to do,) till we have very well examined Particulars, and made several Experiments'<sup>20</sup> and that we should take care 'that the Name of *Principles* deceive us not, nor impose on us, by making us receive that for an unquestionable Truth, which is really, at best, but a very doubtful conjecture, such as most (I had almost said all) of the *Hypotheses* in natural Philosophy' (*Essay* IV. xii. 13). Locke was doubtful whether natural philosophy could go beyond natural and experimental histories:

I deny not, but a Man accustomed to rational and regular Experiments shall be able to see farther into the Nature of Bodies, and guess righter at their yet unknown Properties, than one, that is a Stranger to them: But yet, as I have said, this is but Judgement and Opinion, not Knowledge and Certainty. This way of getting, and *improving our Knowledge in Substances only by Experience* and History, which all that the weakness of our Faculties in this State of *Mediocrity*, which we are in in this World, can attain to, makes me suspect, that natural Philosophy is not capable of being made a Science.<sup>21</sup> We are able, I imagine, to reach very little general Knowledge concerning the Species of Bodies, and their several Properties. Experiments and Historical Observations we may have, from which we may draw Advantages of Ease and Health, and thereby increase our stock of Conveniences for this Life: but beyond this, I fear our Talents reach not, nor are our Faculties, as I guess, able to advance (*Essay* IV. xii. 9–10, underlining added).

It is no surprise then that Locke wrote virtually nothing on method in natural philosophy (*pace* Farr 1987).

## (p. 186) 7.5 The Methodological Reaction Against the Method of Hypotheses: Newton

According to Newton, a hypothesis is a proposition that is *not a phenomenon, nor deduced from any phenomena* but



assumed or supposed without any experimental proof (Edleston 1969: 155). Since hypotheses were antithetical to Newton's methodological programme of theory construction by 'deducing causes from phenomena and rendering them general by induction', it needs to be clarified—at least at an intuitive level—wherein Newton's methodology differed by the method of (sufficient) hypotheses. In the editorial preface to the second edition of the *Principia* (1713), Roger Cotes made two points. The first is that empirical confirmation of conclusions derived from a theoretical principle does not by itself guarantee the truth of that principle;<sup>22</sup> the second is that Newton's *Principia* testifies to a 'truer philosophy', in which causes are established that 'truly exist' (*Principia*: 386). It seems, therefore, that the theory outlined in the *Principia* had not only passed the test of empirical verification, but also that it had succeeded in unravelling causes that truly exist. Now, how did Newton's method differ from the method of hypotheses? The ways in which Newton's methodology, in the phase of model construction, differs from a hypothetico-deductive method can be summarized as follows.

As a way of reducing the risk of arbitrary speculation and the introduction of feigned forces in natural philosophy, Newton demanded that the physical forces producing Keplerian motion should be derived from the laws of motion.

Moreover, not only did Newton require that the forces adduced in natural philosophy should be shown to be sufficient for their effects; he additionally required that these effects should be shown to be necessarily produced by those forces. In other words, Newton demanded that there be a systematic dependency between adduced forces and their effects. In Propositions I–III (Section 2, Book I), Newton dealt with the dynamical implications of Kepler's second 'rule'. In Propositions I–II, Newton argued that a centripetal force is a necessary and sufficient causal condition for the planarity of the orbit and Kepler's area rule, i.e. he argued that the areas of a body described by radii drawn to an unmoving centre of force lie in a fixed plane and are proportional to the times (deductive direction 1; *sufficient cause*), and, conversely, that a body, which by a radius drawn to a centre of force moves along a curved line described in a plane and which describes areas proportional to the times, is urged by a centripetal force tending towards that point (p. 187) (deductive direction 2; *necessary cause*) (*Principia*: 444–8). Taken together Propositions I–II establish that a centripetal force draws a body towards an unmoving centre of force, if and only if, that body describes equal areas, which lie in a fixed plane, in equal times (see Ducheyne 2012: 84–91). The question, then, that Newton is trying to answer in Section 2, Book I, is not so much *Which forces entail Keplerian motion?*, but rather *What are, given the laws of motion, the necessary and sufficient conditions for Keplerian motion?* Establishing that inverse-square centripetal forces are the necessary and sufficient conditions for Keplerian motion warrants that, *given the laws of motion*, Keplerian motion, in general, is produced by inverse-square centripetal forces, and inverse-square centripetal forces alone.

In contrast to the hypothetico-deductivist's attitude towards deviations, according to which deviations are either discarded or explained away by the introduction of ad hoc factors, Newton made discrepancies between phenomena and the mathematical results derived from ideal conditions a focal point of natural-philosophical enquiry. Newton began by establishing the physical conditions under which—*according to the laws of motion*—exact Keplerian motion would occur, so that each deviation from exact Keplerian motion is an indication that there is an additional force to the one under which exact Keplerian motion would occur. In other words, *from the perspective of the laws of motion*, any deviation from exact time-area proportionality is seen as an indication that an additional force, not included in our ideal case, is affecting the situation. Deviations thus become indicative of other forces not tracked in our initial approximation. By means of the propositions expressing systematic discrepancies, Newton was able to measure such additional forces and to trace, in Book III, additional physical sources that could account for these discrepancies.

Finally, in order to back up his argument for *universal* gravitation Newton required the demonstration that the overall inverse-square centripetal force exerted by a body results from the composition of each of the individual inverse-square centripetal forces of the particles constituting that body (Propositions LXX–LXXVI, Book I). In this way, transductive inferences could be licensed by Newton's mathematical demonstrations on the attractive forces of spherical bodies.

Taken jointly, these strategies contain Newton's solution for overcoming the sufficiency question and the issue of transduction. Newton's theory of universal gravitation as developed in Book III was not only established by means of the

physico-mathematical machinery Newton had developed in Book I, but also by the application of a set of methodological rules which were to justify and underwrite the inductive generalizations made in Book III. While the systematic dependencies offered a criterion for the inference of *instances* of centripetal forces, the rules of philosophizing regulated further inductive generalizations—once different instances of centripetal forces were inferred and once further empirical data was provided (see Ducheyne 2009 and Ducheyne 2012 for Newton’s methodology).

## (p. 188) 7.6 Conclusion

During the seventeenth century, British natural philosophy underwent a series of drastic epistemological and methodological transformations. In this chapter, we have mapped out some defining moments of a small area of this complex process of transformation: the changing status of hypothesis and theory. The main contours of the changing status of hypothesis and theory in seventeenth-century British philosophy can be summarized as follows.

Hypotheses played a rather marginal role in Bacon’s methodological thought. Bacon closely associated hypotheses with mathematical models in astronomy, which according to him lacked any physical content. For Bacon ‘theory’, on the one hand, had a pejorative connotation and he closely associated it with ‘dogma’, ‘doctrine’, ‘fable’, and ‘premature speculation (about causes)’. On the other hand, however, Bacon promoted *proper* theorizing and speculating, i.e. theory and speculation about natural causes which take a significant body of natural and experimental histories as a starting point.

In the milieu of the Royal Society, hypotheses occupied centre stage in the Baconian-inspired programme of Boyle and Hooke, who used ‘theory’ and ‘hypothesis’ interchangeably. Most importantly, Boyle and Hooke introduced a new meaning to ‘hypothesis’: hypotheses were conceived of as *causally sufficient and probable explications of natural phenomena that stand in an evidential relation to the natural phenomena they serve to elucidate*. Boyle and Hooke both agreed that legitimate hypotheses may only be framed once a body of natural and experimental histories is established. For Boyle and Hooke a hypothesis’ (mechanical) intelligibility was strongly correlated with its truthfulness. Boyle’s and Hooke’s positive attitude towards hypotheses, however, raised two issues that needed to be taken into account by the natural philosophers after them: (1) *how can transductive inferences be licensed given the fact that the small constituting micro-parts of macroscopic bodies are hidden from our senses?*, and, (2) *what are we to make of the conclusiveness of the demonstrations in natural philosophy, given the fact that they are based on causal sufficiency?*

In an attempt to address these issues, two significant positions were developed. Locke was critical of Boyle’s and Hooke’s identification of a hypothesis’ intelligibility and its truthfulness. Because the primary qualities of the parts of bodies cannot be perceived, Locke concluded that natural philosophy cannot be made a science, i.e. that it is predicated under probability. Locke was sceptical about the usefulness of hypotheses and advised to stick to careful collecting of natural and experimental histories. For Newton, the two issues mentioned above were not at all a reason to succumb: in fact, they motivated him to develop a demonstrative methodology that was not vexed by these problems. Newton’s methodology thereby set out to establish necessary and sufficient causes of natural phenomena (p. 189) in such a way so that transductive steps could be justified. Newton systematically distinguished hypothesis/speculation from theory: a theory is a general proposition established according to his demonstrative methodological desiderata; hypotheses are general propositions not established by Newton’s method of deducing causes from phenomena and rendering them general by induction. An age of epistemological and methodological transformation, indeed!

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## Notes:

(1) According to Bacon, nature exists in three states: nature in its free and ordinary course (*species*), nature forced out of her natural state by violent impediments (*monstra*), and nature constrained and moulded by art and human ministry (*artificialia*) (OFB 11: 454). On Bacon and the maker's tradition, see Pérez-Ramos 1988, especially chapters 5 and 13 and Pérez-Ramos 1996. On Bacon, see furthermore chapters 2 and 6.

(2) It is important to stress that Bacon did not conceive of forms as formal causes; rather, they refer to the universal and fundamental laws which govern and constitute simple natures (OFB 11: 254).

(3) In his philosophical works Bacon mostly used 'theory' (*theoria*) in a pejorative sense. See, most notably: OFB 4: 27, 110; 6: 110, 186 and SEH 2: 146, 286; 3: 91; 4: 155, 315, 460; 5: 440, 444; 6: 65; 7: 17, 21, 24–5, 74–5, 81, 118, 120, 138, 166.

(4) Later Sprat also distinguished between presumptuous, or a priori, speculation practised by the 'Formal man' and 'solid speculation', i.e. a posteriori speculation (Sprat 1667: 107, 341). Joseph Glanvill famously opposed to the possibility of proper speculative knowledge: the senses are inherently deceptive and the causal connections between things are in itself insensible (Glanvill 1661: 189–92, 210). Therefore, hypotheses are only judged on their capacity 'to solve the phenomena' and on their everyday utility (Glanvill 1661: 57, 212).

(5) Bacon denounced discoursing of final causes in empirical research.

(6) Bacon accused Copernicus of not caring about the fictions he introduced into nature, 'provided that his calculations turn out well' (OFB 6: 123).

(7) For example, in a manuscript related to *The Usefulness of Natural Philosophy*, Boyle noted that Bacon 'has mentioned a *Scala ascensora & descensoria*; the former from Experiments to Axioms, the latter from Axioms to Experiments, as designed parts of his *Novum organum*. But that great Genius prevented by Death, having given us nothing of such desirable pieces, but the names, as none has since undertaken to perfect what so great a Master left unfinished' (B 13: 351).

(8) For Boyle's Baconianism see Hunter 2007, Knight and Hunter 2007, Anstey and Hunter 2008, which all temper Laudan's claims (1981, ch. 4) about Descartes' influence on Boyle.



- (9) See also Sprat 1667: 17–18, 31, 35, 38, 101; Glanvill 1668: 87, 91, 112, 118. For Boyle's stress on the need for history to precede theory see *Defence Against Linus* (1662), B 3: 12. For Boyle's recurring distinction between matters of fact and speculation see e.g. B 3: 121; 4: 5; 5: 296; 6: 315; 7: 9, 11; 7: 383; 12: 13. On the socio-political underpinnings of Boyle's experimental philosophy see Shapin and Schaffer 1985.
- (10) Boyle compared the process of hitting on a probable explanation of a particular phenomenon to the process of deciphering a secret code, B 8: 115. Cf. B 5: 197, where Boyle contrasts mathematical versus physical demonstrations.
- (11) See B 8: 104–5, 116 (on its fertility), 109 (on its applicability); B 2: 88; B 8: 75–6 (on its intelligibility).
- (12) Hooke consistently delineated what he thought to have established hypothetically as probable causes, i.e. as conjectures or queries, and what he had established as certain and true causes, i.e. as axioms (e.g. Hooke 1661: 26; Hooke 1665: [vi], [xi], 134, 216, 240; Hooke 1679: 73). Hooke only rarely claimed to have established indubitable conclusions. A notable exception is Hooke's '*experimentum crucis*' to determine between the *Tychonick* and *Copernican* Hypotheses' on the basis of which he demonstrated the necessity of the latter (Hooke 1674: 2).
- (13) Hooke stressed that in order to establish a theory one needs to be 'well furnish'd with that which the Noble *Verulam* calls *Scalam Intellectus*'; he must have scaling Ladders, otherwise the steps are so large and high, there will be no getting up them' (Hooke 1665: 93).
- (14) Hooke wrote little on the specifics of the process of induction in natural philosophy. The announced second part of *A General Scheme*, which is lost or never materialized, was to contain 'the Rules and Methods of proceeding or operating with this so collected and qualify'd Supellex' (Hooke 1705: 8).
- (15) Hooke's two methods were modelled on analysis and synthesis in Greek geometry: in analysis one reasons from assumed theorems to known theorems; in synthesis from known theorems to the theorems one seeks to establish (Hesse 1966: 82). Hooke thereby reversed the common association within natural philosophy of analysis with a process proceeding from effects to causes and synthesis with a process from causes to effects (Ducheyne 2005).
- (16) Hooke did not provide further details on this process.
- (17) Compare OFB 11: 468; 6: 114. See further Boyle to Oldenburg, 13 June 1666 (Boyle 2001, 3: 173) and Sprat 1667: 155–6.
- (18) Locke did not believe that all natural processes could be explained mechanically (*Essay* II. xxiii. 24–8). See Wilson 1979.
- (19) Downing 1998: 403–4 especially; McCann 1994: 66–7 especially. Other papers that have contributed to this trend are Downing 2001, Jacovides 2002, McCann 1998, and Walmsley 2004: 37 especially.
- (20) Locke also claimed that one 'ought to build his Hypothesis on matter of fact, and make it out by sensible experience, and not presume on matter of fact, because of his Hypothesis, that is, because he supposes it to be so' (*Essay* II. i. 10). For men 'who confine their Thoughts to any one System, and give themselves up into a firm belief of the Perfection of any received Hypothesis' are prone 'to be persuaded, that the Terms of that Sect, are so suited to the Nature of Things, that they perfectly correspond with their real Existence' (*Essay* III. x. 14).
- (21) *Essay* IV. iii. 29; cf. IV. iii. 26. Locke was sceptical about the possibility of speculative natural philosophy, i.e. that part of natural philosophy that goes beyond natural and experimental history. See Locke 1989, §190: 244–5. The only exception Locke was willing to accept was Newton's *Principia* (Locke 1989, §194: 248–9).
- (22) Cf. 'For even if these philosophers could account for the phenomena with the greatest exactness on the basis of their hypotheses, still they cannot be said to have given us a true philosophy and to have found the true causes of the celestial

motions until they have demonstrated either that these causes really do exist or at least that others do not exist'. (*Principia*: 393)

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## Substance and Essence

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## Abstract and Keywords

This chapter examines the changes in the concept of substance and essence in British philosophy during the seventeenth century. It analyzes the roles played by substance and essence in different versions of scholastic and Aristotelian philosophy studied and taught during this period, and considers the criticism of Thomas Hobbes, Robert Boyle, and John Locke on these issues. The chapter suggests that Hobbes, Boyle, and Locke engaged with the context of scholastic logic and metaphysics in their discussions of substance and their attempts to reject and replace theories of substantial form.

Keywords: substance, essence, British philosophy, Aristotelian scholastic logic, metaphysics, substantial form, Thomas Hobbes, Robert Boyle, John Locke

## 8.1 Introduction

Substance and essence were versatile and pervasive concepts in early modern philosophy that did a large amount of work across the disciplines of logic, metaphysics, and natural philosophy. Broadly speaking, they spoke to a constellation of questions about the nature and characteristics of things: for many philosophers in this period, the task of describing the properties and qualities of natural and supernatural beings, and of distinguishing them into distinct types or kinds required a theory of substance and essence.

These were also areas in which a great deal of pressure was applied to the explanatory framework seventeenth-century philosophers inherited (often grudgingly) from their medieval and classical predecessors. This chapter considers some of the transformations performed on these concepts in British philosophy during the seventeenth century, focusing on attempts to reject scholastic and Aristotelian accounts of substance and substantial forms. First, I summarize some of the complex roles played by substance and essence in the various late renaissance versions of scholastic and Aristotelian philosophy studied and taught in British and European universities in the seventeenth century, known collectively as the ‘philosophy of the schools’. I then consider three influential, and substantial, critiques and reformulations of scholastic understandings of these (p. 193) questions—those of Thomas Hobbes (1588–1679), Robert Boyle (1627–1691), and John Locke (1632–1704). This is a necessarily partial account of a complex field, but one that is hopefully justifiable on the grounds of coherence—these authors shared a target in the ‘schoolmen’, although to a large extent this was a target they constructed themselves. My emphasis is on Hobbes, Locke and, to a lesser extent, Boyle as *readers* of the scholastic account of substance and essence.

A foundational question motivating much of the recent literature on the relationship between the late scholastics and the *novatores*, or ‘new philosophers’ like Hobbes, Locke, and Boyle, is the extent to which the philosophical culture in which

they were educated, and against which they rebelled, affected their intellectual projects in non-trivial ways (see Edwards 2007; Des Chene 2000; Leijenhorst 2002). The familiar Biblical metaphor of new wine and old wineskins is sometimes used in this context to describe the relationship between the traditional, Aristotelian philosophy and the new—the assumption being that in some cases new doctrines preserved some of their old conceptual ‘wrapping’, although often under some strain (Jolley 2006: 103). Yet despite its worthwhile emphasis on continuity as a significant feature of philosophy in this period, in some respects this image is unsatisfactory. The message of this chapter is instead that if we want to think of the *novatores* or new philosophers engaging with their Aristotelian intellectual context it must sometimes be based on the recognition that their presentation of that context was, perhaps necessarily, deeply partial and polemical. If we must talk of conceptual change in liquid terms, it is perhaps more accurate to think of new wine in old buckets—a somewhat differently shaped and perhaps less subtle vessel that may not have been intended for its new purpose.

## 8.2 Aristotelians and Late Scholastics on Substance and Essence

Appropriately enough for a discussion of a tradition whose commentaries and textbooks frequently opened with an elaborate preface or *captatio benevolentiae* begging the indulgence of their readers, some caveats are necessary here. First, talk of a distinctly ‘British’ Aristotelian philosophy in this period is at best an explanatory convenience, since in this period the erudite Latin intellectual culture of the late scholasticism was genuinely pan-European, and often operated across confessional boundaries (Schmitt 1983). Second, the extent to which we can characterize a ‘typical’ or ‘normal’ late scholastic understanding of substance is debatable. Recent scholarship has emphasized the complexity and diversity of late scholastic approaches, not simply within the familiar intellectual matrix of medieval philosophical (p. 194) ‘schools’ such as Thomism and Scotism, but as a result of the development of eclectic and synthetic treatments of Aristotelianism in textbook form (Schmitt 1988; Edwards 2007: 451–3). Accordingly, this section offers an overview of the field that would have been recognizable in outline, if not acceptable in every detail, to the learned seventeenth-century reader. Its main focus is on sketching late scholastic assumptions about substance and the doctrine of substantial form. My emphasis is on texts and positions that were commonly discussed in the seventeenth-century arts course at Oxford and Cambridge, and well-known continental authors. This focus is justifiable on the grounds that, in the case of Hobbes and Locke at least, the *novatores* often exhibited a strong tendency to argue against texts remembered from their university days.

Aristotle’s discussion of the nature of substance in the *Categories* and in the *Metaphysics Z* is a complex topic in its own right. *Ousia*, which was typically rendered as *substantia* in Latin by later Aristotelian authors, is one of his key metaphysical building blocks or categories: the *Categories* define ‘substance’ as that which is ‘not in a thing, nor of a thing’, whereas the *Metaphysics* imply that form can be seen as a substance, a claim that would later become significant for scholastic accounts of substantial form and the soul. Aristotle’s account was read in a variety of ways in the medieval and classical tradition, many of which were familiar to the authors discussed here. Early modern commentators on Aristotle and scholastic textbook authors typically discussed substance and its attributes in at least three places—in logic textbooks and in commentaries on the *Categories* and works on metaphysics, a division that partly reflected both Aristotle’s multi-focal treatment of the issue and medieval approaches to the question. Their accounts had to cohere with a complex web of pre-existing theological and philosophical commitments, not least with various confessional explanations of the Eucharist and with some form of allegiance to Aristotle’s texts, although by the early seventeenth century, particularly in metaphysics, the latter imperative exerted much less force.

In his 1613 *Lexicon philosophicum*, the German philosopher Rodolphus Goelenius offered a multi-part definition of *substantia* or substance, drawing on both the logical and metaphysical traditions, scholastic commentaries, and more eclectic texts such as Julius Caesar Scaliger’s reply to Girolamo Cardano, the *Exotericarum exercitationum de subtilitate* (1557). The *Lexicon*, a dictionary that offered a pathway through the forest of scholastic philosophical terminology, noted initially that ‘substance’ might be defined in at least six ways:

Firstly in general, as it relates to God. Second, particularly, as it relates to created beings. Third, specially, insofar

as it signifies a substance comprising matter and form. Fourth, it can be understood as a part of substance, as matter and form are. [As Scaliger says] There is no species in the scope of nature, which does not have its own substance, whether substance is taken for matter or for form. Fifth as *persona*. Sixth, as essence (*essentia*) ... as in when the body of Christ ... is said to be the substance of the Catholic faith. (Goclenius 1613: 1097)

(p. 195) We may also, he suggests, speak of the substance of the law (seen either as the letter of the law, or its sense), or even proceed in the manner of the chemists, 'who divide substance into fugitive and fixed. Thus quicksilver is said to be a fugitive substance' (Goclenius 1613: 1097). Substance in the second, third, and fourth senses may be a support to accidents, and itself subsists rather than inhere in another subject.

Goclenius diligently considered substance from many of the perspectives that seemed viable within the late scholastic tradition, although he is guilty of a certain looseness of terminology, reflecting the eclectic, comprehensive ambitions of his dictionary. Of the possible definitions he suggests, the second, third, and possibly the fourth are perhaps the most relevant to the scope of this chapter, since these claims relate most obviously to the scholastic theory of substantial form. His second definition, substance considered in so far as it may be used of created beings, 'which supports accidents' may be further subdivided into 'universal or secondary' substance, and 'singular or primary' substance. Man in general is an example of secondary, universal substance, whereas a particular man such as Cato is primary substance. Goclenius also goes on to distinguish between what he calls 'two senses' of perfect and imperfect substance (Goclenius 1613: 1098), perfect being either that which does not contribute to the composition of other subjects, or which, like a composition composed of distinct elements, exists according to itself (*propter se*). Imperfect substances, on the other hand, are those which are intended to contribute to the composition of another subject. Goclenius' example here is the case of prime matter and the substantial form of the soul discussed in commentaries on Aristotle's *De anima*, which exist in a tight and complex union in living beings. The other sense of 'imperfect substance' is that which contributes to or composes part of a composite, such as particular elements within a whole. Finally, Goclenius notes that 'the scholastics' also describe substance as total or partial, a distinction that again maps onto the division between whole or composite and part, where 'partial' substance might include form, which although independent of matter, nevertheless informs it. It might be held that incomplete or imperfect substance is a logical inconsistency, but most late scholastics upheld this distinction (Des Chene 1996: 76–7).

The tendency to subdivide substance into types or sub-categories in this way is an authentically Aristotelian trait, originating in the discussion of primary and secondary substance in the *Categories*, and given additional weight by the Porphyrian tradition of logic trees. Delineating an expanded list of the various kinds of substance in tabular form, a tendency that was fuelled by the growth of the Ramist pedagogical method in the late sixteenth century, was also a common preoccupation of the scholastic textbook tradition (Hotson 2007). This typology of substance is perhaps most helpful in revealing the potential diversity of approaches to the topic. A number of significant themes emerge from this account, though—most significantly here, the way in which the concept of substance offers a way of distinguishing between individuals, and a concern with substance in so far as it (p. 196) might form part of composite arrangements of matter and form. Underlying this is the more complex series of claims concerning substance as it relates to substantial form, which will be discussed in the second part of this section.

Substance was numbered first amongst the ten Aristotelian logical categories, or the building blocks on which scholastic logic was based, and thus one of the first ideas of reason. What early modern logic textbooks offered was therefore primarily an account of substance considered as the subject of predication, although they frequently ventured into other areas. A fairly typical treatment of substance in the logical tradition is given in the textbook of Richard Crakanthorpe (1567–1624), a Fellow of Queen's College, Oxford, and later vicar of Black Notley in Essex. Crakanthorpe published his *Logicae libri quinque* in 1622. Along with Robert Sanderson's *Logicae artis compendium* (1615) and the logics of Franco Burgersdijk (or Burgersdicius) (1590–1635) and the Jesuit Martin Smiglecius (1562/4–1618), Crakanthorpe's logic had a long afterlife in Oxford and Cambridge undergraduate teaching during the seventeenth century.

According to Crakanthorpe, substance stands before all the other categories 'as much in dignity, and perfection, as in the

order of nature' (Crakanthorpe 1622: 71). The ultimate *genus* of this category, in Crakanthorpe's view, is complete substance, 'that is, that which supports (*substat*) accidents as the ultimate subject in which they inhere' (Crakanthorpe 1619: 74). Again, complete substance may be distinguished into primary and secondary, which as with Goclenius' definition tracks the difference between particular individuals (Crakanthorpe's examples are 'Socrates, this lion, this horse') and *genera* and species such as man, animal, or body. Like most contemporary logic textbooks, Crakanthorpe's account of the properties of complete substance emphasizes the notion of its role in supporting accidents—substance as the subject of predication is also a substrate or basis for accidents. Crakanthorpe also summarizes in tabular form (or *series substantiae*) the different species of created substance, beginning with spirit (a grouping that includes angels and the rational soul) and body (which subdivides into the four Aristotelian elements, mixed bodies, inanimate bodies, and the most significant category of animate beings, which encompasses plants, animals, and man) (Crakanthorpe 1619: 78–9). He emphasizes both the schematic nature of this classification, and the extent to which it must be provisional. Crakanthorpe suggests that a fuller account of the various kinds of substance, a 'very slow and arduous, but immensely fruitful' task, falls under the domain of natural philosophy, and would be provided specifically in his planned *Introductio in Physicam* (Crakanthorpe 1619: 80). A work by this title survives in manuscript in the Library of Queen's College, but was not published in Crakanthorpe's lifetime. The interconnections between the general account provided by scholastic logic and the richer account of the properties and characteristics of particular substances provided in natural philosophy are significant for any understanding of this tradition: certainly, to its proponents the comprehensiveness of this approach seemed a strongly positive feature.

(p. 197) Crakanthorpe's account of substance may be compared to that found in the *Summa philosophiae quadripartita* (1609) of the French author, and the favourite scholastic punch-bag of Descartes, Eustachius a Sancto Paulo (1573–1640). Although Crakanthorpe and Eustachius' work originated in different confessional and intellectual contexts (Crakanthorpe in Elizabethan and Jacobean Oxford and the world of Protestant textbook authors such as Clemens Timpler; the Catholic Eustachius in the primarily Scotist *Weltanschauung* of the University of Paris Theology Faculty), their take on substance shares common assumptions. The *Summa* was printed in both Cambridge and London in the first part of the seventeenth century. Richard Holdsworth's *Directions for a Student in the Universitie* (c. 1637), an early seventeenth-century manuscript guide held in the Library of Emmanuel College, Cambridge, mentions Eustachius' *Summa quadripartita* as one of the books of 'Logical Controversies' (that is, a text used to sharpen skills in disputation) to which students should attend (Fletcher 1961: 635). Holdsworth also recommended Crakanthorpe's *Logica* as a worthwhile supplementary system of logic, to be read after students had grasped some of the fundamentals (Fletcher 1961: 636).

The first book of Eustachius' *Summa* deals with substance in the context of logic, and defines substance in general as 'being subsisting or existing by itself' (*ens subsistens seu per se existens*), a definition that, as he points out, captures secondary substance as much as its primary form (Eustachius 1609: 96). Substance subsists in so far as it depends on nothing else for its being; it is also a support to accidents. Eustachius also discusses the distinction between primary and secondary substance, noting that 'this division of substance into primary and secondary, or particular and universal, is not a division of a genus and species, as the division of substance into body and soul is, nor of the whole into parts, as is the division of corporeal substance into matter and form' but rather a division according to modes of being, 'namely universality and particularity' (Eustachius 1609: 98). Like Crakanthorpe, Eustachius outlined the different forms of substance in tabular form, preserving the typical distinction into incomplete and complete substances, corporeal and incorporeal, animate and inanimate. Unlike Crakanthorpe, however, Eustachius invested considerable energy in describing the various forms of incorporeal substance—angels, hierarchies, powers, and dominions (Eustachius 1609: 105–6). Both textbooks thus go beyond an account of substance in terms of predication to give an account of how substance allows us to distinguish kinds, that is, delineating the particular substances and bodies that form the subject matter of natural philosophy.

Discussions of substance in the kind of early modern metaphysics textbooks commonly read at Oxford and Cambridge in the seventeenth century shared many of the assumptions of the logical tradition, but also engaged with other questions. The main goal here was something closer to an account of substance in terms of its (p. 198) ontological significance. On a basic level, the late Aristotelian world picture was to a large extent one populated by various different kinds of substance, and one goal of metaphysics and natural philosophy was to describe and analyse this complexity. Both Crakanthorpe and Eustachius also

discussed substance from a metaphysical perspective. Crakanthorpe devoted several chapters of his *Introductio in metaphysicam* (1619) to substance, as did Eustachius in the fourth part of his *Summa*, fleshing out aspects of the account of substance given in their logic texts. The division of labour between Crakanthorpe's logical and metaphysical works is spelled out in Chapter 10 of his *Logicae*, where he notes that there are many other significant properties of substance beyond the account given in Aristotle's *Categories*, but discussion of them belongs in the *Introduction in metaphysicam*, not in logic (Crakanthorpe 1619: 77). Although both of these authors engage with contemporary debates, their texts are self-consciously limited in ambition and scope, with few of the systematic aspirations of texts like the Jesuits Francisco Suárez's *Disputationes metaphysicae* (1597) and Petrus Fonseca's commentary on Aristotle's *Metaphysics*, or indeed the complexities of medieval discussions. As Holdsworth emphasized in his *Directions*, these were works intended to survey the field and initiate beginners. Nevertheless, it was often with texts of this kind that the critics of late scholastic philosophy engaged.

Although the philosophical landscape behind them is complex, a number of common features emerge from both Goclenius' *Lexicon* and these schematic textbook accounts. First, for late scholastic authors, substance was an ontologically basic category. Substance did not need other substances in order to exist—that is, it does not *inhere* in another subject, but subsists. As both Goclenius and Eustachius put it, one definition of subsistence is not to depend on something else for one's existence: 'This is therefore called existing per se. Thus the rational soul ... subsists in the body' (Goclenius 1613: 1094; Eustachius 1609: 97). Substance is that which can be said to exist per se, rather than inhering in or depending on something else, in the manner of accidents such as colour or shape. Particular substances are composite entities, composed of prime matter (which, in the Thomist tradition is pure potentiality, *pura potentia*) and substantial form. For an account of the essence or essential nature of beings, we must therefore look to late scholastic discussions of substantial form.

This is a problematic task, not merely because of the complexity and diversity of late scholastic positions on the topic. As Des Chene (and, in a less sympathetic way, many early modern critics) has pointed out, it is hard to define exactly *what* substantial form was, if that question is understood in terms of its internal structure or essential nature—even for textbook authors like Eustachius and Crakanthorpe, who were obsessed with schematic explanations of complex questions, this was not necessarily the relevant question (Des Chene 1996: 75). Rather, they were interested in what it *did*. For late scholastic authors in a broadly Thomist (p. 199) tradition, substantial form represented the real essence of beings, offered a causal explanation of their powers and properties, and a means of distinguishing between species and kinds. As the Jesuit Coimbra commentary on Aristotle's *Physics* put it, substantial form is 'that in which the essence of every natural compound is particularly contained, or what completes the essence of a thing and its definition, and distinguishes it from other things' (van Ruler 1995: 60). Substantial form is united with matter in a composite substance, and perfects that matter. Substantial form is generally held to be simple (since it is distinct from the whole composite of form and matter) and clearly distinct from accidental form. It also describes the *essential* properties of an individual—a distinct collection of accidental properties present in an individual. Greyness and softness might be properties present in both a cat and a carpet, yet cats are not carpets—for late scholastic authors, a theory of substantial form explained why this should be so (Des Chene 1996: 73).

Debates about substantial form in late scholasticism were fierce and complex, touching on issues such as the subsistence of matter without form and the thorny problem of individuation. The Thomist notion of composites composed of substantial form and prime matter (conceived of as *pura potentia*) was one late Aristotelian possibility within a variety, including the Scotist notion of a *forma corporeitatis* (Des Chene 1996: 64–5). Furthermore, beyond the schematic account drawn here from logic, metaphysics, and natural philosophy, a large amount of effort went into explaining substantial form in the context of debates about the soul (and in particular the separable, rational soul) in the extensive commentary literature on Aristotle's *De anima* (Cranz 1976; Des Chene 2000). United with the anatomical structures of bodies, the soul conceived of as a substantial form gave an explanation of the principles and characteristics of living organisms, and most prominently of human beings. Challenges to Aristotelian notions of substance therefore risked straying into theologically risky territory.

A number of scholars have charted internal developments in the doctrine of substantial form within late Aristotelianism. Consequently, it has become more common to emphasize a move within this eclectic climate away from substantial form as



the key determinant of the characteristics of bodies. This development has been characterized in terms of prioritizing the properties of matter (specifically, its structure and organization) and simultaneously downplaying form in causal explanations (Emerton 1984; Ariew 1999: 77–96). By the latter part of the seventeenth century, it was not uncommon for eclectic Scholastics on the Continent such as Emmanuel Maignan to downplay or dispute the role of substantial form entirely (Maignan 1653). Within the English Aristotelian tradition, Kenelm Digby began to extend Aristotelian philosophy in an explicitly mechanistic direction (Digby 1644). The precise contours of this move are debatable, but from some perspectives, the late scholastics begin to look, while perhaps not mechanistic in outlook, at least more recognizable to the *novatores* (Ariew 1999: 96).

### (p. 200) 8.3 Substance and Essence in the New Philosophies

Scholastic understandings of the nature of substance, essence, and substantial form, were pervasive in the intellectual life of English universities before, and in many cases after, 1650. This was the metaphysical backcloth against which the competing ‘new philosophies’ of the seventeenth century emerged. However, to many observers from the late sixteenth century onwards this backing began to look increasingly tattered. Late scholastic notions of substance, and in particular notions of substantial form, came under concerted attack on a number of fronts from the late sixteenth century onwards. Common criticisms centred on their perceived lack of coherence or explanatory economy, and on the need to revise them on the basis of experimental or empirical accounts of the structure of matter, and in particular mechanical or corpuscular hypotheses.

In the case of substance and essence, these new approaches to nature had to speak to a number of (explicit or implicit) criteria set out by their readers and opponents. For instance, as Descartes’ opponent Gisbertus Voetius vehemently put it, if they wished to jettison the scholastic concepts of substance, accident, and substantial form, the *novatores* still had to explain how different kinds of being were to be differentiated: ‘For in their theory there cannot be any substantial difference between a wolf, a sheep, a whale, an elephant, a snake, a stone, a tree, a turnip, an aconite, wheat, the Sun, the Moon [and] the Earth’ (van Ruler 1995: 60). For Voetius, explanations of distinctions between substances in terms of the structure and differentiation of their internal parts seemed philosophically sterile. For *novatores* like Hobbes, Locke, and Boyle, although they each approached these questions in different ways, such models appeared more promising.

The rest of the chapter emphasizes the extent to which their reconsideration of scholastic categories involved creative and frequently rancorous dialogue with late scholastic and Aristotelian concepts and terminology. In different ways, this dialogue involved both reading the scholastic position (with varying degrees of attention and interpretative charity) and concerted attempts to rethink its assumptions in the light both of new philosophical approaches and empirical discoveries.

The impact of European attacks on late Aristotelian philosophy was felt keenly by British authors in the period. As with the scholastic and Aristotelian traditions, developments in the new philosophy were not confined by national boundaries. Of particular significance was René Descartes’ attempt to rethink the concept of substance, outlined in most detail in his *Principia philosophiae* of 1644. The precise scope of Descartes’ reformulation of substance, which evolved over time, has been extensively discussed and falls beyond the remit of this chapter. One relevant point here, however, is the extent to which he was willing to appropriate and redefine the scholastic (p. 201) vocabulary. Although to an extent he preserves aspects of contemporary scholastic terminology in talking about *substantia*, Descartes departed radically from the complex scholastic typology of substances by reclassifying substance into just two kinds—*res cogitans* and *res extensa*, thinking substance and extended substance. Descartes’ revaluation of substance provoked a number of critical responses by British philosophers such as Thomas Hobbes and Henry More. The focus of the rest of the chapter, however, is not on responses to Descartes but on alternative attempts to think through some of the problems he addressed from different perspectives.

### 8.4 Thomas Hobbes

Hobbes' discussion of substance and essence, outlined in *De corpore* (published in Latin in 1655, translated into English in 1656) and in *Leviathan* (1651) attacked on two fronts. First, he undertook an aggressive exercise in philosophical ground-clearing, attempting to replace scholastic theories with an account that denied the existence of substantial form, and redefined the work done by the scholastic concepts of substance and essence in terms of body, motion, and the mind. Second, Hobbes' argument criticized the gravely problematic philosophical and political consequences of the views he sought to replace. As such, it engaged the scholastic and Aristotelian traditions with substantial polemical bite. Yet recent scholarship, particularly that of Cees Leijenhorst, has emphasized the extent to which this polemic was fundamentally an exercise in *redefinition* or re-description—that is, one based on a close reading of late Aristotelian language and concepts (Leijenhorst 2002). This reading argues that Hobbes used the familiar Latin terms *substantia*, *accidentia*, and *essentia* in consciously innovative ways, as what Dennis Des Chene in the context of Descartes' philosophy has called 'transfer terms'—instances where commonly accepted language is used to draw more controversial conclusions.

The extent to which these views developed or evolved over the course of Hobbes' long philosophical career is contested. The early *A Short Tract on First Principles*, a manuscript which has been attributed to Hobbes (Brandt 1928; Schumann 1995; Leijenhorst 2002), but is now more convincingly linked to his associate Robert Payne (Malcolm 2002 and Raylor 2001) presented an account of substance and accident heavily inflected by the kind of scholastic Aristotelianism found in contemporary textbooks. The *Short Tract* argued that substance is 'that which hath being not in another, so as it may be of it self. as Aire, or Gold'; here the *Tract's* author offers no more detailed discussion of distinct kinds or categories of substance. Accident, on the other hand, 'is that which hath being in another, so as, without the other it could not be' (Hobbes 1988: 14). From these principles follow the straightforwardly Aristotelian (p. 202) conclusions that '1. Everything is eyther Substance or Accident', '2. No Accident can be without a Substance', '3. The uttmmost Subiect of Accident is Substance': that is, that substance is ontologically basic, it is characterized by subsistence and not inherence, and, to echo scholastic terminology, it is the ultimate subject of predication (see Leijenhorst 2002: 140–5). Although scholars such as Leijenhorst and Karl Schumann have accepted the *Tract* as an authentically Hobbesian work, it is hard to integrate this fairly schematic Aristotelian account convincingly with Hobbes' later published thoughts on the subject, a point that to my mind supports arguments for Payne as the *Short Tract's* real author.

It is certainly clear that Hobbes deviated substantially from the approach followed in the *Short Tract* in his later publications. The conceptual divide between the two approaches is essentially that between an unexciting and conventional hylomorphic picture of substance and one that dispenses with substantial form and revises the concept of substance itself along mechanistic lines. As most commentators have remarked, Hobbes' first move is to replace the familiar scholastic dyad of *substantia* and *accidentia* with *corpus* (body) and *accidentia*. In *De corpore* Chapter 8 ('Of Body and Accident'), the account of body begins by rerunning the annihilatory hypothesis Hobbes first introduced in Chapter 7 ('Of Place and Time') or, as Hobbes put it there, 'from feigning the world to be annihilated' (*DCo* 91). Thus, as he notes in Chapter 7, if someone were to imagine that the world no longer exists, 'there would remain to that man ideas of the world, and of all such bodies as he had, before their annihilation, seen with his eyes, or perceived by any other sense; that is to say the memory and imagination of magnitudes, motions, sounds, colours &c as also of their order and parts' (*DCo* 92). These remaining images would be purely internal, mental productions, but 'yet they will appear as if they were external, and not at all depending upon any power of the mind' (*DCo* 92). Hobbes believed that his annihilatory hypothesis illustrated the subjectivity of sensory qualities, demonstrating that 'though all things be still remaining in the world, yet we compute nothing but our own phantasms'. The account of space and time in Chapter 7 is built on these 'phantasms'. In chapter 8, however, Hobbes moves beyond the mental images remaining after the hypothetical annihilation of the world to posit the emergence of a new body. This body is defined as '*that, which having no dependence upon our thought, is coincident or coextended with some part of space*' (*DCo* 102). Body is ontologically real (that is, it is not imaginary) and is, as Hobbes puts it, '*a thing subsisting of itself*' (*DCo* 102). Defining accident, however, appears to cause him more difficulties: 'But what an *accident* is cannot so easily be explained by any definition, as by examples' (*DCo* 102). As Hobbes puts it, 'they answer best that define an *accident* to be *the manner by which any body is conceived*; which is all one as if they should say, *an accident is that faculty of any body, by which it works in us a conception of itself*'; later in the same passage, he compresses

this formula into ‘*the manner of our conception of a body*’ (DCo 102–3). Hobbes does not, as some readings of *De corpore* suggest, adopt a purely subjectivist (p. 203) interpretation of the nature of accidents, since accidents necessarily derive from our perception of real bodies (Leijenhorst 2002: 155–63). Accidents inhere in bodies not ‘as if any thing were contained in that body’, but ‘as magnitude, or rest, or motion, is in that which is great, or which resteth, or which is moved’; that is, in an echo of the Aristotelian definition, ‘*not as in a any part thereof, but as that it may be away, the subject still remaining*’ (DCo 104). Although ‘extension’ and ‘figure’ are inseparable from bodies, all other accidents ‘do perish continually, and are succeeded by others’ (DCo 104), and are therefore separable.

Chapter 34 of *Leviathan* summarizes Hobbes’ view on the real definition of the ‘words BODY and SPIRIT, which in the language of the Schools are termed, *Substances, Corporeall, and Incorporeall*’ (Lev. 34: 269). As in *De corpore*, body is seen to be synonymous with substance, rather than (as in the typical Aristotelian understanding) one amongst many kinds of substance:

The word *Body*, in the most generall acceptation, signifieth that which filleth, or occupyeth some certain room, or imagined place; and dependeth not on the imagination, but is a reall part of that we call the *Universe*. For the *Universe*, being the Aggregate of all Bodies, there is no reall part thereof that is not also *Body*; nor any thing properly a *Body*, that is not also part of (that Aggregate of all *Bodies*) the *Universe*. The same also, because Bodies are subject to change, that is to say, to variety of apparence to the sense of living creatures, is called *Substance*, that is to say, *Subject*, to various accidents; as sometimes to be Moved, sometimes to stand Still; and to seem to our senses sometimes Hot, sometimes Cold, sometimes of one Colour, Smel, Tast, or Sound, sometimes of another. And this diversity of Seeming, (produced by the diversity of the operation of bodies, on the organs of our sense) we attribute to alterations of the Bodies that operate, & call them *Accidents* of those Bodies. And according to this acceptation of the word, *Substance* and *Body*, signifie the same thing; and therefore *Substance incorporeall* are words, which when they are joined together, destroy one another, as if a man should say, an *Incorporeall Body*. (Lev. 34: 269–70)

From the outset, Hobbes therefore made a number of calculated moves against the scholastic hylomorphic synthesis. As well as eliding substance and body in a thoroughly un-Aristotelian manner, Hobbes also redefined the status of accidents. Rather than properties inhering in particular substances, accidents were instead the effects produced by the motion of bodies on our senses. Accident now does much of the work performed by substantial form in scholastic metaphysics, in that the qualities and properties of a body are explicable in terms of the effects bodies produce on us. In Hobbes’ account, there is no longer a need for substantial forms to explain either the properties of a substance or its essence. Significantly, the essence of natural bodies is no longer derived from their substantial form, but rather from particular motions that produce mental representations in us. In fact, Hobbes links essence and accident together in *De Corpore*, arguing that the essence of a particular body is, and is only, the particular accident (based on motion) that causes us to distinguish between different bodies (Leijenhorst 2002: 163).

In Hobbes’ view, scholastic metaphysics and theology, which relied on substantial forms and incorporeal substance to do large amounts of explanatory work, were (p. 204) committing a simple but very significant logical fallacy. Certainly, in positing incorporeal substance they were guilty of what he elsewhere had called ‘insignificant speech’. As such, his critique of the ‘*Jargon*’ of ‘*Abstract Essences, and Substantiall Formes*’ is part of this broader attack on the cloying spiderwebs of scholastic language (Lev. 46: 463). But this ‘*Jargon*’ also operated in the service of a broader theologico-political agenda that Hobbes criticized in Book IV Chapter 46 of *Leviathan*, ‘Of Darknesse from Vaine Philosophy, and Fabulous Traditions’. Hobbes’ denial of the existence of substantial form and incorporeal substance therefore had a specifically political, as well as a philosophical agenda—it tells just as much against the Catholic Church as against Descartes’ notion of a *res cogitans*. These prize exhibits of scholastic ‘insignificant speech’ and conceptual subterfuge, Hobbes argued, are intended to mask a more sinister agenda. Specifically, they sustain a number of beliefs that reinforce the special status and power of the clergy, and specifically of the Catholic Church: the superstition that the souls of the dead are ‘seen by night amongst the graves’, the notion of the soul’s judgement after death, the theory of transubstantiation, and the conviction that

faith and other virtues may be ‘sometimes *powred* into a man, sometimes blown into him from Heaven’ (*Lev.* 46: 465). All of these claims depend ultimately on the existence of immaterial substances and, in the case of transubstantiation, on a definition of accidents as properties inhering in and potentially separable from substance that directly conflicts with Hobbes’ view, and which ‘serve to lessen the dependance of Subjects on the Sovereign Power of their Countrey’. In undermining the metaphysical grounds of these claims, Hobbes believed that he also struck at the temporal and spiritual authority of the clergy.

Hobbes’ argument that, ‘though the Scripture acknowledges spirits, yet doth it nowhere say, that they are incorporeal’ had a number of theologically controversial consequences, not least in its implication that the human soul must be mortal. The precise intellectual context, and heterodox nature, of Hobbes’ theology is a murky area, but it is intimately connected to his philosophical claims about substance. However, the broader implications of his attack on incorporeal substance sat uneasily with a great many of his contemporary readers. Henry More’s *Immortality of the Soul* (1659) was one of a range of highly critical responses to Hobbes that attempted to defend the notion of incorporeal substance against Hobbesian materialism.

## 8.5 Robert Boyle

For all his eclectic intellectual interests, Robert Boyle is perhaps best known as a philosopher of *qualities* (Anstey 2000: 17): for him, all causal talk in natural philosophy must involve the qualities of bodies, and not substantial forms or essences in the scholastic sense. One significant reason for this is his conviction (p. 205) that we should not place great explanatory weight on a conception of form to which we can have no epistemic access. Boyle’s natural philosophy has been set in a variety of intellectual contexts, most obviously that of the Baconian project of natural history, but also including chemical matter theory and alchemy, eclectic atomism such as that of Daniel Sennert (Newman 1996) and of earlier English atomist and eclectic peripatetic philosophy, such as that of Walter Warner and Nicholas Hill (Clucas 1997). This brief account centres on his rejection of scholastic accounts of substance and essence in the *Origin of Forms and Qualities* (1666/7). *Forms and Qualities* expressly engages with what Boyle called the ‘wranglings and idle speculations of the Schools’ (B 5: 283) in a variety of ways. The degree of interpretative charity that he exhibited in this project is open to debate; Boyle himself makes it clear that his primary target is specifically the later ‘Scholastick Interpreters’ of Aristotle, rather than the whole peripatetic tradition—and the knowledge of it displayed in *Forms and Qualities* is certainly more extensive than that of Hobbes. His overall strategy is to show that his corpuscularian hypothesis (that is, an explanation of the nature and properties of bodies in terms of their internal structure and parts) gives a more convincing, and at its heart more economical, account of substance that fits with existing experimental data.

*Forms and Qualities* attempts to undermine a cluster of claims that underpin scholastic notions of substantial form (most notably in his view the art/nature distinction and the theory of real qualities, which Boyle criticizes extensively (Anstey 2000: 21ff)). Boyle also discussed several different kinds of chymical experimental proof of the falsity of substantial forms in the second part of the work (see inter alia Newman 2006). This is of course consistent with his broader strategy of opposing the ‘Logical and Metaphysical Notions and Niceties’ of the scholastics to ‘Physical Observations and Reasonings’ (B 5: 289). The key claim arising from these experiments (such as the experiments concerning the redintegration of nitre) was that, rather than positing substantial forms to explain the change, the result could best be explained through a corpuscularian account of the texture and properties of matter: as he put it at the end of this part of *Forms and Qualities*, ‘For in the Experiments we are speaking of, it cannot well be *pretended*, or at least not well *prov’d*, that any Substantial Forms are the Causes of the Effects I have recited’ (B 5: 442). In the case of nitre/saltpetre, according to Boyle the redintegration result is best explained in terms of the texture produced by the recombination of atoms, rather a substantial form that would (impossibly, on the scholastic account) have to be immediately regenerated as the substance was reconstituted. Boyle sought to replace scholastic substantial forms with an authentically corpuscular notion of ‘form’—the form of a natural body was what he called a ‘*Stamp* of its Matter, or such a convention of the Bigness, Shape, Motion (or Rest), Scituation, and Contexture, (together with the thence resulting Qualities) of the small parts that compose the Body’ (B 5: 353).

(p. 206) Significantly, Boyle bracketed the rational soul outside of his criticisms of scholastic substantial forms. Unlike Hobbes or other more thoroughgoing materialists, he claims that ‘when ever I shall speake indefinitely of Substantiall forms, I would alwayes be understood to except the Reasonable Soule, that is said to inform the humane Body’ (B 5: 300). In late scholastic thought, the soul was always a special kind of substantial form, since the separability of the rational soul from the body was a theological and philosophical given. Thus from a theological perspective, any revision of notions of essence and substance needed to take the soul’s special status into account, as Hobbes found to his cost. Boyle’s approach recognizes this demand. He thus endorsed something closer to the Cartesian account of an incorporeal human soul and material body than the Hobbesian model. Whether this strategy amounts, as some scholars have suggested, to the preservation of a hylomorphic approach is another question.

## 8.6 John Locke

A great deal of scholarly controversy surrounds Locke’s account of substance in *An Essay concerning Human Understanding* (1690) (see inter alia Bennett 1971, 1987; Alexander 1985). He has been read, amongst other interpretations, as giving an account of substance as identifiable with the real essence of bodies, as a ‘bare particular’, or as a support to the qualities and powers we perceive in bodies. In common with a number of other commentators (and specifically following McCann 2001 and 2007), I suggest that it is most helpful to see Locke’s thoughts on substance as triangulating a course in relation to two intellectual goals: first, his own commitment to essentially corpuscularian explanations of the nature and properties of bodies, and second to the reading of substance as *substratum* he identified within the scholastic tradition.<sup>1</sup> This course emphasized both the poverty of our commonplace attempts to describe the real nature of substance and the largely unsatisfactory role it had played in philosophy to date. To a much greater degree than McCann however, I wish to emphasize the extent to which the picture of substance and essence that Locke (and indeed Locke’s modern interpreters) drew from the late scholastic tradition is necessarily limited in scope.

One thing about which most commentators have agreed is that Locke’s definition seems on initial reading vague and somewhat unsatisfactory. In his discussion (p. 207) ‘Of our complex ideas of substance’ in Book II, Chapter 23 of the *Essay*, he characterizes our idea of substance as originating in ‘some *Substratum*’ in which our simple ideas ‘subsist, and from which they do result, which therefore we call *Substance*’ (*Essay*: 295), ‘something, [I] know not what’. Thankfully he elaborates on this remark, although in the opinion of some of his critics not necessarily in helpful directions. If someone were to consider his notion or idea of ‘pure Substance in general, he will find he has no other Idea of it at all, but only a Supposition of he knows not what support of such Qualities, which are capable of producing simple Ideas in us; which Qualities are commonly called Accidents’. Substance is thus a support to the qualities possessed by a body, such as colour or weight, whose precise characteristics remain unclear. As Locke puts it,

The *Idea* then we have, to which we give the general name Substance, being nothing, but the supposed, but unknown support of those Qualities, we find existing, which we imagine cannot subsist, *sine re substantia*, without something to support them, we call that Support *Substantia*; which, according to the true import of the Word, is in plain English, *standing under*, or *upholding*. (*Essay*: II. xxiii. 2)

However, Locke suggests that interrogating this account more closely produces a kind of regress: ask in what colour and weight inhere, ‘he would have nothing to say, but the solid extended parts’ (*Essay*: II. xxiii. 2). Pressing harder on this explanation, however, produces little return. We are in no better position than the apocryphal ‘poor Indian Philosopher’ Locke first introduced earlier on in the *Essay* (*Essay*: II. xiii. 19), ‘who, saying that the World was supported by a great Elephant, was asked, what the Elephant rested on; to which his answer was, a great Tortoise: But being again pressed to know what gave support to the broad-back’d Tortoise, replied, something, he knew not what’.

Tortoises and Indians apart, many aspects of Locke’s description of substance in general seem on first inspection to track late scholastic accounts in the logical tradition quite closely. Certainly, Locke himself made this connection. In his



correspondence with Bishop Stillingfleet, Locke emphasized the conventional aspects of his account, and its apparent agreement with what he saw as the standard scholastic account of *substantia* as substratum or a support to qualities, advanced by many within the schools, amongst whom he specifies Franco Burgersdijk and Robert Sanderson. This self-description has some biographical and bibliographical plausibility, since we know that Locke owned and annotated a number of late scholastic logic primers, recommending particular logics to his Christ Church pupils; certainly, his reading of the scholastic tradition was more extensive than that of Hobbes (Milton 1984). In describing substance as a support to qualities (or accidents), Locke is apparently consistent with the accounts given by Crakanthorpe, Burgersdijk, and others.

However, he dissents from the confident late Aristotelian assumption that substance, as one of the basic metaphysical and logical categories, has real (p. 208) philosophical value. Underlying Locke's discussion in Book Two, Chapter 23 and elsewhere in the *Essay* is a deep and pervading scepticism about the efficacy of our common concepts of substance to do serious explanatory work. A glance at the first few entries for 'SUBSTANCE' in the Index to the *Essay* gives a clue to Locke's ambivalent attitude: 'Substance no Idea of it', 'Not very knowable', 'Our certainty concerning them reaches but a little way' (*Essay*: 745). Two things emerge at this stage: Locke emphasizes 'that of *Substance*, we have no *Idea* of what it is, but only a confused obscure one of what it does' (*Essay*: II. xiii. 19), and that he wished to emphasize the scholastic context of some of his claims about the nature of substance in general. The first of these claims can be reconciled readily with the second, since many medieval and early modern scholastic authors actually acknowledged the notion that our cognitive grasp on the positive nature of substance is relatively weak (Pasnau 2011: 168).

Taking Locke's description of substance at face value has raised a number of well-known problems for many commentators. Chiefly, it might seem to commit Locke to a notion of substance as a 'bare particular'—that is, to an argument that substance as substratum has no intrinsic properties beyond merely existing or supporting other properties. On this reading, our idea of substance is in a sense content-less. This is arguably not Locke's intention, however—he does not wish to deny that substance has any properties, merely emphasize that we cannot obtain secure knowledge of them. The ultimate message is that a substance–attribute ontology is of little use if we wish to erect any further superstructure of philosophical claims upon it. In a sly way, then, Locke's account of our idea of substance is an anti-foundationalist assault on what he sees as the unwarranted explanatory pretensions of scholastic logic and metaphysics (McCann 2007). What this reading, which McCann has dubbed the 'no-theory' theory of substance, offers is an explanation of Locke's project that cuts a path between scholastic insignificant speech on the one hand, and the inability of natural philosophy to give us certain truths about the natural world. Emphasizing the scholastic context (as opposed, say, to the equally obvious one of Boyle's corpuscularian philosophy) as a lens through which to view Locke should not blind us to his other targets. Dawson has emphasized the extent to which elements of Locke's arguments draw on long-standing debates within early modern accounts of language (Dawson 2007: 200–1). Locke is also deeply sceptical of the claims of scholastic logic accurately to map out the world: 'this whole *mystery* of *Genera* and *Species*, which make such a noise in the Schools, and are, with Justice, so little regarded out of them, is nothing else but abstract *Ideas*, more or less comprehensive, with names annexed to them' (*Essay*: III. iii. 9). Consequently, the foundations of the elaborate taxonomies of substance beloved of Crakanthorpe and his late scholastic contemporaries can be swept away.

Just as Hobbes' redefinition of substance in terms of body was intended as an intervention against Cartesian dualism, Locke's scepticism about the nature of substance as substratum can also be seen as an attack on Descartes' confident (p. 209) division of substances into *res cogitans* and *res extensa*. Moreover, it is important to emphasize that the scholastic notion of substance that Locke confronts here is a pared-down version; what he emphasizes in his debate with Stillingfleet is the *consonance* of his approach with the logical tradition, not its exact correspondence.

However, Locke's attack on scholastic metaphysics was not confined narrowly to its theories of substance. His account of real and nominal essence also involved developing a calculated alternative to the theory of substantial form. Although he treats them in less expansive form than Boyle, Locke is clear that substantial forms are, in his view, both an incoherent explanation of the essential properties of bodies and an unsatisfactory way of sorting them into distinct kinds. He notes that those

who have been taught, that the several *Species* of Substances had their distinct internal *substantial Forms*; and that it was those *Forms*, which made the distinction of Substances into their true *Species* and *Genera*, were led yet farther out of the way, by having their Minds set upon fruitless Enquiries after *substantial Forms*, wholly unintelligible, and whereof we have scarce so much as any obscure, or confused Conception in general. (*Essay*: III. vi. 10)

Real essences are the internal constitutions or microstructure of bodies, what Locke calls the ‘constitution of the insensible parts of that Body’, or ‘the real internal, but generally in Substances, unknown Constitution of Things’ (*Essay*: III. iii. 15) on which its sensible qualities are dependent. We have only very limited epistemic access to this ‘Constitution’, and in many cases none whatsoever. Consequently, real essence cannot provide the basis for distinguishing between substances: this can only be achieved through nominal essences. Nominal essences are ‘the workmanship of the Understanding, taking occasion from the similitude it observes among them’, but they are not wholly arbitrary. Some debate exists about how far Locke believed that nominal essences map onto the structure of real essences—that is, how far real essences are *relative* to nominal essences. Natural philosophy may give us imperfect access to corpuscular structure, but it nevertheless is possible to improve the account of the nature of things that we have, and thereby revise our account of nominal essences. A loose comparison might be drawn here with Locke’s treatment of substance. Simply because our common idea of substance is imperfect does not mean that the concept is evacuated of *all* value: similarly, just because our knowledge of real essences is shaky does not mean that they are merely relative to nominal essences.

Locke’s account of substance, real and nominal essence attracted criticism from a variety of directions (McCann 2001). Predictably, contemporaries writing from a broadly Aristotelian perspective, such as John Sergeant or indeed Stillingfleet, were critical of what they perceived to be an attack on the nature of substance itself (Sergeant 1697; Stillingfleet 1697a, 1697b, 1698; Southgate 1993). Yet of the three *novatores* discussed in this chapter, Locke perhaps took most seriously the implications (and the limitations) of replacing the scholastic account of substantial form with an account based on the structure, properties, and motion of matter.

## (p. 210) 8.7 Conclusion

Many of the myths of origin constructed by early modern philosophers concerned their relationship to earlier intellectual traditions. In different ways, Hobbes, Boyle, and Locke engaged with the context of scholastic logic and metaphysics in their discussions of substance and their attempts to reject and replace theories of substantial form. Two themes have been emphasized in this chapter: first, the extent to which this engagement necessarily homogenized the subtleties of the late scholastic debate and, second, the persistence of the language of substance and essence in philosophical discourse throughout the seventeenth century. Des Chene has suggested the notion of ‘transfer terms’ to describe the project of re-describing scholastic terminology in order to do new things with it. A rhetorical term familiar to all seventeenth-century scholars might serve as well—that of *paradiastole*, or rhetorical re-description. For all their talk of undermining the scholastic edifice, what they attacked was sometimes a ‘thick’ re-description that fitted their specific polemical purposes.

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## Notes:

(1) Robert Pasnau also identifies scholastic discussions of substance as crucial to grasping the moves Locke makes in this regard, but notes that the pay-off of emphasizing this context is that Locke’s view comes to seem ‘quite unoriginal, even banal’ (Pasnau 2011: 159).

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## The Nature of Body

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## Abstract and Keywords

This chapter examines how the problem of the nature of body had become the central debate in the field of natural philosophy in England by the middle of the seventeenth century. It explains that the nature of the physical body is one of the major problems of seventeenth-century natural philosophy and that it began, at least in part, as a byproduct of a change in the philosophical vocabulary. The chapter also evaluates solutions proposed to address the problem concerning the nature of body, including those derived from theory of matter and mixed mathematics.

Keywords: nature of body, natural philosophy, England, physical body, philosophical vocabulary, theory of matter, mixed mathematics

THE second edition of Isaac Newton's *Mathematical Principles of Natural Philosophy* (1713) appeared in print with a number of philosophical additions constituting what are to this day the most widely discussed Newtonian fragments: the famous 'Rules of Philosophizing'; a polemical preface by the editor Roger Cotes; and the even more puzzling 'General Scholium'.<sup>1</sup> Among other peculiar features, these additions endorse a strong phenomenalist reading of material bodies. Newton claims that we cannot know the nature of any substance and we can only infer its properties 'from phenomena' (*Principia*: 942). More particularly, he claims that we have only limited phenomenal access to all the properties of bodies, including impenetrability and extension: we experience the extension and impenetrability of the surrounding bodies and infer the presence of these properties in all bodies whatsoever on the basis of the 'analogy of nature' (*Principia*: 795). Not only do we not know what the inner substance of bodies is, we can only infer that they exist, are extended, and impenetrable through a complicated process involving experience (experiments) and analogical reasoning.

Such additions are consistent with the fact that Newton's *Principia* contains no proper definition of body, not even a nominal or a tentative definition of the objects to which it refers. In short, the *Principia* is a treatise on the principles of natural philosophy that contains no definition of body but has a number of (p. 214) passages claiming that the nature of bodies is bound to remain unknown while we have only a phenomenal and mediated access to their properties (see Jalobeanu 2007). This is, however, not the case in Newton's other writings. On the contrary, even a cursory reading through Newton's manuscripts shows a serious interest in the very questions that the *Principia* intimates are unanswerable, namely: What is the nature of body?<sup>2</sup> How can we know what bodies really are? What would be a 'good definition' of body for the purposes of doing the science of motion?

In fact, one finds in Newton's published and unpublished works a number of tentative definitions of body, all trying to select a minimal number of conditions—such as mobility, impenetrability, inertia (see, e.g. McGuire 1970)—that will allow the possibility of constructing a physics of bodies in motion. A draft of Book I of the *Principia* goes even further, listing among the definitions the following:

*By common consent* bodies are moveable things unable to penetrate each other. (Herivel 1965: 310)

Yet this projected definition did not find its way into the published *Principia*, for Newton was keenly aware that there was no such consensus. In fact, wide disagreement had transformed the question of the nature of physical bodies into one of the major issues of seventeenth-century natural philosophy a good number of years before Newton's attempts to provide a minimal (operational) definition.

## 9.1 The Missing Definition

The nature of physical body is one of the major problems of seventeenth-century natural philosophy. One may even say that it is *the* major problem because of the substantial number of philosophical ramifications and (expected and unexpected) consequences that follow from it. It had metaphysical, epistemological, and theological implications. It was an unsolved problem, with all the challenges, fierce debates, and keen awareness that such a problem could generate.

It began at least in part as a by-product of a change in the philosophical vocabulary. Sixteenth-century manuals of natural philosophy traditionally open with a definition of natural philosophy as the science of natural body. In a somewhat simplified version of the scholastic physics this meant demonstrative (p. 215) knowledge of natural and celestial objects in so far as they possess natures (Ariew and Gabbey 1998: 433), that is, having in themselves the principles of motion and rest. Natural philosophy had a theoretical and general part dealing with principles and accidents of all natural bodies and an applied part dealing with types of bodies (elements, qualities and mixtures, celestial and terrestrial bodies and their transformations) (Ariew and Gabbey 1998: 427). It is within the framework of *physica generalis* that one can find the definition of natural body as a composite of two principles, form and matter, or, more precisely, as the result of a complex process through which the amorphous and mere potential prime matter (*materia prima*) is in-formed by the 'substantial form' (*forma substantialis*). How this was supposed to work was traditionally a matter of debate within the Aristotelian tradition (Ariew and Gabbey 1998; Des Chene 1996). However, what was widely agreed upon was the result: a world of individual bodies defined in terms of general principles (matter, form, privation).

The traditional philosophical vocabulary describing the nature of bodies came under attack from within and from outside the Schools in the sixteenth century. In part, this was probably a result of the aggregation and flourishing of natural philosophy as a discipline: a *scientia* growing from a remarkable number of commentaries on Aristotle's *libri naturales*,<sup>3</sup> but gradually gaining autonomy and strength,<sup>4</sup> sometimes with a local, national, or confessional focus.<sup>5</sup> Various eclectic alternatives developed within the Schools (Schmitt 1993), and some of them had interesting consequences for conceptions of body. One such far-reaching philosophical consequence was the transformation of *prime matter* from a pure potentiality to an actual substratum of the world (see, e.g. Dupleix 1611: 20ff; Des Chene 1996: 81ff). Such a move had various causes, invoked different philosophical sources, and was put to use in more than one way. However, it raised a number of interesting questions concerning the nature of body and its properties.

In one of the most popular textbooks in early seventeenth-century England, John Case's *Lapis philosophicus*, bodies—the objects of physics—are seen as in-formed prime matter (the actual substratum of the world) (Case 1599: 127). Case explicitly discusses questions of divisibility of matter, *minima naturalia*, and the (p. 216) ways in which one can identify and individuate bodies arising through the process of in-formation from a primordial substratum. Mixing Aristotelianism with hermetic language, Case claims that 'prime matter is as it were in a wood, in which there are many leaves and shadows, under which the many and great mysteries of nature are hidden' (Binns 1990: 276). In a similar way, another rather popular book of sixteenth-century continental Protestant theology, Nicolaus Taurellus' *Philosophiae triumphus* (1573), posits a fully existing, substantial prime matter of determinate extension. As a result, bodies are seen as being composed of essential and unchanging parts, the building blocks of nature (see Leijenhorst and Lüthy 2002: 398–9).

Actualizing matter and talking about the permanent substantial substratum of the world went hand-in-hand with re-conceptualizing the process of in-formation, where substantial forms were seen more like active powers acting in the material substratum.<sup>6</sup> The question of the nature (essence) of body was recast, therefore, among many of the late Scholastics, as a question concerning the nature and activity of forms in matter.<sup>7</sup>

If among the Scholastics there was disagreement as to the use of the traditional hylomorphic vocabulary, outside the Schools the whole conceptual scheme of Aristotelian hylomorphism came under serious attack. The 'new philosophies' drew from alternative doctrines of body and the physical world—atomism, neo-Platonism, Stoic or Hermetic sources—which were put to work to account for the structure of matter and the aggregation of bodies. The Aristotelian conceptions of 'matter' and 'form' were subject to serious revision and sometimes dropped in favour of other notions. Meanwhile, mocking the old scholastic theories and their confused notions became one of the standard gambits of any book on natural philosophy. In a lively and witty *Philosophical dialogues concerning the principles of natural bodies*, William Simpson introduces the topic through the complaints of an old scholastic (Hydrophilus) feeling compelled to 'turn school-boy again' (Simpson 1677: 5):

how can a man restrain from passion, while he observes a company of you innovators endeavour ... to bereave a man of his beloved Notions, to rob him of his first conceiv'd Opinions, to tumble the Philosophical Orb up-side down, yea by ransacking and demolishing ours. (Simpson 1677: 2–3)

The new philosophers we are told 'appear upon the Stage of the World, like so many *Americans*, presenting new and unheard of things, yea like so many innovators in Philosophy, every one bringing his Beads, Rattles etc., I mean his new Notions, (p. 217) filling the ears of the people with your so much nois'd Mechanical Experiments' (Simpson 1677: 2).

However, in the second half of the seventeenth century, despite decades of attacks and satire against the Schools, there was still no consensus among the innovators as to what should replace the old philosophical vocabulary and the situation was often pictured as a crisis. The nature of body was at the very centre of the crisis. With the disagreement over what could give identity, intelligibility, and individuation to a physical body after the displacement of substantial forms from the philosophical vocabulary, natural philosophers were left to explore ancient alternatives and combine eclectic sources to define their very object of investigation, namely, physical bodies. And by 1670s there was almost common agreement upon the fact that the problem was far from being solved. As Robert Boyle noted:

the Notion of Body in general, *or what it is that makes a thing to be a Corporeal Substance, and discriminates it from all other things*, has been very hotly disputed of, even among the modern Philosophers, & *adhuc sub judice lis est*. [the jury is still out]. (B 8: 66)

It is little wonder then that in the last part of the seventeenth century the nature of body became a sensitive subject in the camp of the *novatores*. Since natural philosophy was still defined as the science of physical body by all parties involved,<sup>8</sup> the missing definition of body became an issue in the debate between the old (Aristotelian) philosophy and the new philosophical sects of the moderns. In some quarters, the 'missing definition' was regarded as the biggest failure of the moderns in their attempts to construct a new, safe, and sound natural philosophy, in contrast with the ramblings of the Scholastics.

In England the issue seems to have been particularly sensitive. In the apologetic defences of the Royal Society, for example, the missing definition of body and the wide disagreement among the *novatores* concerning the nature of body became a standard example for the poor state of natural philosophy (and sometimes, an example of the natural limits of human knowledge in general). Failure to provide a sound account of the nature of bodies was often seen as the major reason for the existence of philosophical sectarianism.

In this survey I will first show in what way the problem of the nature of body moved to the forefront of debates in England by the middle of the seventeenth century. I will sketch a number of philosophical consequences arising from the increased awareness among seventeenth-century natural philosophers that they were dealing with an unsolved problem in the very

core of the new philosophy. I will briefly review a number of solutions arising from the various attempts to deal with the nature of body starting from matter theories. I will then show how an (p. 218) alternative solution developed as an attempt to talk about bodies with the instruments of mixed mathematics.

## 9.2 Starting from a Theory of Matter

Alternatives to the Aristotelian view on the nature of body developed at first in terms of new theories of matter. Early in the seventeenth century a wide range of such new theories were available. Some started from a more traditional Aristotelian perspective, but discussed the composition of bodies in terms of *minima naturalia*<sup>9</sup> or asserted the existence of a space distinct from matter (Ariew 1999: 132). Others drew from the alternative traditions of Epicurean atomism or Neo-platonic hermeticism and alchemy. Still others adapted to their own agenda various Paracelsian doctrines.

Numerous recent attempts have been made to chart and classify this interesting proliferation of matter theories in the first part of the century. They have managed to alter significantly the canonical story of a ‘new’ mechanical philosophy gradually replacing older qualitative theories of matter; they effaced the former standard distinctions between what were taken to be the major camps of the debate, i.e. Aristotelian hylomorphism, Paracelsian doctrines, atomism, and the mechanical philosophy. Instead, what has emerged as a result of recent investigations is a more complex picture. On one hand, non-mechanical theories of matter remained in place well into the second half of seventeenth century and played a prominent part in the new science (Clericuzio 2000, 2001; Garber et al. 1998). On the other hand, natural philosophers constructing new matter theories seemed to have been highly eclectic, so that atomists freely adopted a number of Paracelsian doctrines,<sup>10</sup> late Scholastics were drawn to affirm the existence of indivisible *minima naturalia* and a separate empty space,<sup>11</sup> and a considerable number of alchemists held corpuscular theories of matter (Newman 1991, 1993; Clericuzio 2000).

(p. 219) Last but not least, it is now clear that there was no such thing as *the* mechanical philosophy. Instead, one can speak at best about *mechanical philosophies*: a diversity of theories with various assumptions concerning the basic constituents of matter and constantly at war with each other (Garber et al. 1998; Garber 2002, forthcoming). When it comes to the missing definition of bodies, the ‘mechanical’ philosophers (Descartes, Hobbes, Gassendi, Boyle, and Charleton among others) had different questions and different solutions to the unsolved problem. Some defined bodies as aggregates of particles sticking together because of their shapes or just because they were at rest with each other; others defined bodies as continuous geometrical shapes endowed with properties. Void was both affirmed and denied and served various purposes when it came to answer important questions such as: What is an individual body? Do bodies have actual parts? What is cohesion? What accounts for the resistance or inertia of physical bodies? and so forth. The disagreement among mechanical philosophers was so serious and so visible that the classification of philosophical sects according to their matter theory became a standard opening for a large number of philosophical treatises well into the eighteenth century. Take, for example, Ralph Cudworth’s classification of atheism in his massive *True Intellectual System of the Universe*. There are four kinds of philosophical atheism according to Cudworth and they all originate from a historical and philosophical corruption of the true atomist physiology.<sup>12</sup> What differentiates them from the ‘correct’ form of atomism and what distinguishes between them are their answers to specific questions concerning the source of activity, force, and secondary causation. All four forms of corrupted philosophy illegitimately endowed material bodies with life, forces, or active powers. Consequently, they have invented all sorts of fantastic and irrational doctrines based upon a confused notion of body and a confused doctrine of immaterial substances (TIS: 49).

Arguably, what is really important for Cudworth’s project is not to establish the correct theory of matter, but to spell out the implications that a wrong conception of the nature of body can have upon our faculty of judgement or the salvation of our souls. The missing definition of body is therefore seen as having direct and far-reaching consequences upon metaphysics, theology, and moral philosophy.

Cudworth’s attack on sectarianism and philosophical heresies founded on erroneous matter theories is at least partially



motivated by the bad press that Epicureanism received in seventeenth-century natural philosophy (Wilson 2008: 14–17). (p. 220) However, it might also be read as an attempt to rescue at least some elements of atomism from moral, religious, or philosophical condemnation.

Walter Charleton's proposal for a new reformed natural philosophy in his *Physiologia Epicuro-Gassendo-Charltoniana* (1654) begins with a similar classification of the contemporary philosophical sects engaged in an endless and sectarian war. This was the first serious and extended discussion of Gassendi's atomism in the English-speaking world. For Charleton, there are two principles of classification: the method of investigation and 'the nature and essence of bodies' (Charleton 1654: 16). Against sectarian divisions over the correct method of doing philosophy, Charleton's proposal is eclectic. When it comes to deciding over the nature of bodies, however, the way out is a bit more complicated, for there are at least three sects of 'new', 'sound', and mechanical philosophies. What they all have in common, however, is the missing definition of bodies.

The first sect is that of the followers of Epicurus and Gassendi; they claim that a body is an aggregate of particles and has as essential properties size, figure, resistance (solidity *and* impenetrability), and gravity. The second sect is that of the Cartesians who reduce matter to extension and define bodies in a geometrical fashion (Charleton 1654: 17). The third sect, Charleton claims, is an 'immoderately subtle' one that makes a distinction between substance, quantity, and extension and defines bodies through their quantitative 'measure': 'Others, by an excessive acuteness of Wit, dividing the *Substance* of a Body from the *Quantity* thereof, and distinguishing *Quantity* from *Extension*' (Charleton 1654: 17).

There is no name attached to this third sect, but the probable target of Charleton's accusation of 'excessive acuteness of Wit' is Kenelm Digby, a leading figure in seventeenth-century natural philosophy in England and author of a celebrated book on the nature of body (and soul) (Digby 1644). Digby had his own solution to the problem of the missing definition, but his questions were strikingly similar to what we have seen so far. In the extended preface to his *Two Treatises*, Digby claims that although his main purpose was to construct a solid argument for the immortality of the soul, he found himself obliged to begin with a (much longer) treatise on body, because the present knowledge on the nature of bodies is scarce, subject to endless disputations, and filled with incomprehensible and superstitious notions (Digby 1644: 4–5). For Digby, the main feature of physical bodies, the 'primary affection' and 'the root of all the rest', is not extension but quantity, or the capacity of being divided,<sup>13</sup> of having potential or actual parts.

Wherefore, when we consider that Quantity is nothing else, but the extension of a thing; and that this extension, is expressed by a determinate number of lesser extensions of the same nature; (which lesser ones, are sooner and more easily apprehended then greater; because we (p. 221) are first acquainted and conversant with such; and our understanding graspeth, weigheth and discerneth such more steadily; and maketh an exacter judgement of them) and that such lesser ones are in the greater which they measure, as partes in a whole; and that the whole by comprehending those partes, is a meere capacity to be divided into them; we conclude, that *Quantity or Biggnesse*, is nothing else but divisibility; and that a thing is bigge, by having a capacity to be divided, or (which is the same) to have partes made of it. (Digby 1644: 9)

Quantity, however, is not composed of indivisibles and bodies do not have actual parts; Digby is not an atomist but a reformed Aristotelian. His quantity is 'imbibed' on substance and the different proportions between substance and quantity give us different bodies (i.e. matter of different densities) (Digby 1644: 22–3). Other properties, the Aristotelian qualities and elements, arise from a combination of density and gravity (Digby 1644: 28, 40–1).

Digby claims that his notion of body can solve the current difficulties of the alternative solutions proposed by Descartes and Gassendi. Unlike Gassendi, the bodies defined through Digby's notion of quantity are not mere aggregates. Unlike Descartes, Digby claims to be able to solve the difficult problem of rarefaction and condensation and explain density without, however, appealing to the wrong atomist alternative of introducing a new principle, vacuum, into the world.<sup>14</sup> When it comes to explaining physical processes, Digby is a corpuscularian; most of the natural processes are reduced to mechanical explanations. Gravity and the mysterious action of 'weapon salve' are explained through continuous streams of particles emanating from the objects and replacing other streams of particles in a continuum (Garber et al. 1998: 568). However,

there are also ‘active principles’ and substances in the world, such as the universal action of fire and light (Digby 1644: 77).

I have used the examples of Digby, Charleton, and Cudworth to show in what ways natural philosophers of very diverse orientations were keenly aware of the philosophical implications posed by the missing definition of bodies. The problem of the missing definition, although formulated in terms of a matter theory, extended far beyond matter theories or even cosmology as such. It became a foundational problem for the discipline of natural philosophy, defining the scope, purpose, and extent of natural philosophical investigations. It even went beyond natural philosophy, having important consequences for epistemology, metaphysics, and theology.

If bodies are mere aggregates of particles, old philosophical problems concerning individuation and identity over time have to be tackled again. By addressing the very problematic question whether matter is active or passive and by enquiring into the sources of activity in the world, the discourse about the nature of body (p. 222) incorporates questions concerning secondary causation, active principles, and the modes of divine intervention in the world. Seventeenth-century philosophers became increasingly aware of such problems and many tried to seek alternative routes to traditional matter theory, formulating operational replacements for the ‘missing definition’. For example, Charleton’s own solution to the problem of ‘missing definition’ is a staunch empiricism:

Of the existence of *Bodies* in the World, no man can doubt, but He who dares indubitate the testimony of that first and grand Criterion, *SENSE*, in regard that all *Natural Concretions* fall under the perception of some one of the Senses: and to stagger the Certitude of Sense, is to cause an Earthquake in the Mind, and upon consequence to subvert the Fundamentals of all Physical Science. (Charleton 1654: 18)

Again, historically speaking, Charleton’s emphatic appeal to the senses came at the precise moment when exactly such an ‘Earthquake in the Mind’ was already taking place. By the time Charleton was writing these very lines, a number of manuals or compendiums of natural philosophy in England and on the Continent sought to prove (*pace* Descartes) the very existence of physical bodies.

### 9.3 The Reception of Cartesianism in England: Demonstrating the Existence of Body

The major Cartesian contribution to the problem we are discussing was shifting the emphasis from ontology to epistemology. The pressing problem, in other words, should be not: What is a physical body? but rather, What kind of knowledge can we have about physical bodies?

Despite the celebrated proof of the existence of bodies in the Fifth Meditation (a proof doubted and contested by many seventeenth-century Cartesians; see McCracken 1998: 625–34), Descartes’ own answer to the above question is formulated in terms of moral certainty (see Ariew 2011: 38–9). We can merely have corroborated perceptual evidence concerning actual bodies and physical processes taking place in the material world, while our demonstrations rely heavily on hypotheses (AT IXB: 318–19). Physics, therefore, as well as our knowledge of the existence of bodies, rely both on a demonstrative structure where hypotheses play a very important role *and* on our perceptual knowledge giving corroborated sensations of the existence of the external world (see Larmore 1980).

(p. 223) There was widespread discussion of this line of thought among the Cartesians in France. In England, the reception of this particular aspect of Cartesianism remains to be written. For our purposes here it suffices to offer a small number of examples showing that Descartes’ epistemological and metaphysical questions regarding the existence of bodies were visible and important in mid- to late seventeenth-century England. For example, one can see them behind the peculiar construction of Hobbes’ *De corpore*. Unlike Descartes, Hobbes based his conception of body upon a pre-existing conception of space. However, this is not the space of the atomists (or Gassendi);<sup>15</sup> it is not a metaphysical principle, not even a principle of

natural philosophy. Hobbes moves the discussion from the domain of metaphysics to that of logic (epistemology). Both our conception of space and an operational definition of body are obtained through an elaborated construction of the mind, beginning with the well-known thought experiment: What would remain should God annihilate the world? The answer, according to Hobbes, is that a hypothetical survivor of the annihilation will have a conception of space arising from the mere memory and imagination of his former sense impressions (*DCo* II.7.1; see Garber et al. 1998: 581–2). These memories and imaginations of magnitude, motions, sounds, etc. as something previously existing outside of our mind suffice, Hobbes claims, to construct a common notion of *imaginary space*. This, in turn, suffices for giving a definition of body as ‘that, which having no dependence on our thought, is coincident or coextended with some part of space’ (*DCo* II.8.1).

Epistemological questions of Cartesian origin were used both against the new natural philosophy, in order to undermine its pretences to replace the philosophy of the Schools, and as serious arguments in favour of the new experimental philosophy. In John Smith’s *Select Discourses*, Cartesian moral certainty is understood as mere probable knowledge, emphasizing therefore the inferior status of our knowledge of the natural world in comparison with the knowledge we can attain about our own mind/soul:

If we reflect but upon our own Souls, how manifestly doe the *Species of Reason, Freedome, Perception* and the like, offer themselves to us, whereby we may *know* a thousand times *more distinctly* what our *Souls* are then what our *Bodies* are? For the former we know by an immediate converse with our selves, and a distinct sense of their Operations; whereas all our knowledge of the Body is little better then meerly historically, which we gather up by scraps and piecemeals from more doubtfull and uncertain experiments which we make of them. (Smith 1660: 98)

On the other side, in the camp of the experimental philosophers, the derivative and historical knowledge that one may have of physical bodies was seen as a confirmation of the true method in natural philosophy. As summarized by John Locke, (p. 224) unlike our demonstrative knowledge of the existence of God, or the intuitive knowledge of our own existence, we can only have a ‘sensitive knowledge’ of the existence of bodies (*Essay* IV. ii. 4 and xi. 9). However, ‘no body can, in earnest, be so sceptical, as to be uncertain of the existence of those things which he sees and feels’ (*Essay* IV. xi. 3). Therefore, one can have a limited knowledge of body:

*only by Experience* and History, which is all that the weakness of our Faculties in this State of *Mediocrity*, which we are in in this World, can attain to ... Experiments and Historical Observations we may have, from which we may draw Advantages of Ease and Health, and thereby increase our stock of Conveniences for this Life: but beyond this, I fear our Talents reach not, nor are our Faculties, as I guess, able to advance. (*Essay* IV. xii. 10)

When it comes to developing his own doctrine of the nature of body, Locke proposes his own list of primary qualities that might help us formulate an operational definition. They are ‘Solidity, Extension, Figure and Mobility’ (*Essay* II. viii. 9). They are:

utterly inseparable from the Body, in what estate soever it be; such as in all the alterations and changes it suffers, all the force can be used upon it, it constantly keeps; and such as Sense constantly finds in every particle of Matter, which has bulk enough to be perceived, and the Mind finds inseparable from every particle of Matter. (*Essay* II viii. 9)

However, the list of properties is by no means complete. On the one hand, it leaves open the question of how bodies operate upon one another: whether the sole interaction is through impulse or whether there are other kinds of non-mechanical interactions.<sup>16</sup> On the other, it raises questions concerning God’s interventions in the world through superadding qualities to created substances (see Ayers 1981).

## 9.4 Mechanical Philosophies and the Missing Definition of Body

When experimental philosophers such as Walter Charleton, Robert Hooke, and other members of the early Royal Society advocated the sensory and ‘historical’ experience as our only source of knowledge concerning physical bodies, they were keenly aware of the paradoxical situation created by the problem of the missing definition. On the one hand, all mechanical philosophies (experimental or speculative) made (p. 225) appeal to the invisible, corpuscular explanations of visible phenomena. On the other hand, all knowledge of the material world was seen as originating in sensory experience. Can experiments extend the realm of our sensory perception and improve our senses so that we can gather sensory and historical experience of corpuscles and their interactions? Unsurprisingly, we can find this line of argumentation among the partisans of experimentation: maybe the construction of more powerful microscopes will provide the solution to the problem of the missing definition. This is the bold claim put forward by Robert Hooke in his Preface to *Micrographia*: the microscope will provide helps for the senses leading eventually to the discovery of the ‘subtily of the composition of Bodies’, the ‘structure of their parts’, and ‘texture of their matter’ (Hooke 1665: sig. a4). Such presumptive claims sparked debates around the newly formed Royal Society (see Power 1664, Preface). One result was that experimental philosophers such as Boyle, Power, and Hooke were forced to elaborate more complex explanations of how one can use experiments for ‘the Discovery of the more internal Texture and Constitution, as also of the Motion, Energy and operating Principle of Concret Bodies’ (Hooke 1705: 61).

Robert Hooke never gave up the claim that ‘the *real*, the *mechanical*, the *experimental* Philosophy’ can be used to train and to augment our natural faculties so that, ideally, we can eliminate most conjectures and fanciful notions concerning the nature of bodies and replace them with ‘real knowledge’ (Hooke 1665: sig. a3). A mere instrument such as the microscope, however, is not enough: or, rather, we need both instruments to extend the senses and other techniques and instruments to improve the superior faculties of the human mind: memory and the understanding (see Hesse 1966). Hooke’s project involved a specially constructed philosophical natural history to fit both the structure of the visible world and the inner workings of memory, and a philosophical algebra (Hooke 1705: 7) functioning as an instrument for extending the powers of the intellect. The first application of such an (unfinished) project would be, Hooke claimed, a more thorough investigation into the nature of bodies, one able to give us a more probable (but only probable) set of hypotheses regarding the structure of natural bodies, corroborated from the observed effects.

While never denying the capacity of experiment to extend the powers of our senses,<sup>17</sup> Robert Boyle took another (public) line of defence: he urged natural philosophers to abandon the quest for the ultimate matter theory altogether and adopt a methodological corpuscularianism that would both end the sectarian war and provide common grounds for the formulation of further hypotheses to be tested. This is the project behind the famous manifesto Boyle published in 1666: *The Origin of Forms and Qualities*. This is a complex text; it can be read as a political manifesto destined to end the sectarian war (Garber 2004: 6–7); or as trying to establish a common ground for the Cartesians and Gassendists and common (p. 226) enemy that can unite the divided factions of the *novatores* (Jalobeanu 2006). One can also read *Forms and Qualities* as Boyle’s answer to the problem of the missing definition: as providing an operational definition of bodies. The basis of this operational definition is the modified concept of form, namely, the ‘essential modification’ or ‘stamp of its matter’ (B 5: 352–3), i.e. a minimal collection of properties describing a physical body. Such a description will tell us nothing about the true nature of body; it merely gives us enough to distinguish and trace down a certain body as the object of our (experimental) physics.

However, the ‘essential accidents’ are here taken to be, by convention, a minimal collection of properties that are still compatible with the fundamentals of the corpuscularian hypothesis. They are, in other words, properties upon which natural philosophers of mechanical orientation can agree. Boyle does not exclude the possibility that one can find in bodies other properties, the effect of less mechanical features of corpuscles. In fact, when developing his theory, Boyle made use of such other properties: when discussing the generation of bodies or actual physical processes he sometimes reverts to postulating seminal rudiments, principles, or to various discussions concerning God’s active power over the world. The use of the operational definition, however, springs from it being a provisional convention. Adopting such an open and operational definition of body does not contradict the major tenet of experimental philosophy: keeping hypotheses subservient to experience (Anstey 2005: 224). One can imagine further experimentation adding supplementary properties to Boyle’s list.

The condition of an operational definition being a ‘minimal collection’ translates therefore into a simple and sane principle of economy. But its real importance lies in the fact that it shows a way out of the problem of the missing definition: formulating an operational definition all mechanical sects can agree upon is the key for preserving a common disciplinary front of the ‘new’ natural philosophy.

Unsurprisingly, it never worked. More than one of Boyle’s contemporaries described the Royal Society of the 1660s and 1670s as a battleground between Cartesians and Gassendists (Sorbière 1664; Glanvill 1665). However, the division was no longer just a question of adopting the correct theory of matter. In the 1670s, in the context of reiterated debates over collisions and the laws of motion, a group of mathematicians and leading voices within the Royal Society proposed an alternative route to solve the problem of the missing definition. It was in many ways a continuation of Descartes’ project for a mathematical physics (see Jalobeanu 2011). It looked at physical bodies with the instruments of geometry and mechanics.<sup>18</sup> Like Boyle, John Wallis, John Wilkins, William Petty, and Christopher Wren (among others), also aimed at an operational definition of bodies. Unlike Boyle, however, they were not interested in matter theory. Instead, they looked at bodies (p. 227) as geometrical shapes endowed with mathematical properties and subject to *laws* of motion. In doing this, however, they had to abandon the traditional conceptual framework of natural philosophy and borrow instruments and methods from another early modern cluster of disciplines: mixed mathematics.

## 9.5 Bodies in the Tradition of Mixed Mathematics: Mathematicians within the Royal Society

In 1660 John Wilkins, one of the driving forces behind the establishment of the Royal Society, described the business of the *virtuosi* as the promotion of ‘Physico-Mathematicall-Experimental Learning’. In 1664, another mathematician, William Petty, delivered a paper to the Royal Society urging members to ‘apply [their] *Mathematicks* to *Matter*,’ for only by the rules of number might natural philosophy and especially matter theory, free itself from the confusion of qualities and words (Petty 1674: 5).

In doing this, Wilkins, Wallis, and their followers inside the Royal Society were transgressing a traditional disciplinary division (Mancosu 1996; Bertoloni Meli 2006; Dear 1995). The disciplines of mathematics and natural philosophy were traditionally seen as dealing with radically different questions about the world: natural philosophy was a search for natural causes, mathematics sought demonstrations based on the formal properties of magnitudes (Dear 1995: 167–8). A number of issues were, however, traditionally seen as being at the border of the two disciplines; such was the ‘science of motion’. It was studied by a special discipline, mechanics, belonging traditionally to mixed mathematics (other such disciplines within the field of mixed mathematics being astronomy, optics, and music; see Gabbey 1992; Bertoloni Meli 2006). The field of mechanics, however, grew constantly during the seventeenth century and the prominence of the science of motion posed many disciplinary questions to those like Wilkins, Wallis, Petty, and their mathematically trained colleagues in the Royal Society. Their major interest in the 1670s was in solving questions connected with the motion of bodies. While doing so they were drawing upon a ‘new science’, sometimes referred to as physico-mathematics (Dear 1995: 168–79).

Issac Barrow, Newton’s professor of mathematics at Cambridge, gives us a good picture of the ‘new science’ in his *Lectiones mathematicae* (1683). Barrow makes the traditional distinction between pure and mixed mathematics: the first deals with quantity, the second deals rather with physical accidents. Therefore, some people (p. 228) called it ‘physico-mathematicas’ (Dear 1995: 178; Barrow 1734: 21). Mixed mathematics, Barrow claims:

ought all to be taken as Parts of *Natural Science*, being the same in Number with the Branches of *Physics* ... For Magnitude is the common Affection of all physical Things, it is interwoven in the Nature of Bodies, blended with all corporeal Accidents, and well-nigh bears the principal Part in the Production of every natural Effect ... there is no Part of this [physics] which does not imply Quantity, or to which geometrical Theorems may not be applied, and consequently which is not some Way dependant on Geometry; I will not except even *Zoology* itself.



(Barrow 1734: 20–2)

A similar direction of thought can be found in John Wallis' *Mechanica: sive, de motu, tractatus geometricus* (1670). For Wallis, mechanics is that part of geometry that deals with local motion and investigates, using geometrical reasoning, 'the force with which such and such motion takes place' (Wallis 1693, 1: 575). Within the disciplinary boundaries of mixed mathematics, one can speak of bodies as *solid magnitudes* generated by real motions in a homogeneous space (Barrow 1734: 146). Such objects are the starting points of the doctrine of motion developed by the mathematicians of the Royal Society in the 1660s.

The development of a new 'doctrine of motion' is listed by Thomas Sprat in his *History of the Royal-Society* (1667: 312) as one of the major achievements of the *virtuosi*. In Sprat's view, the initiator of a doctrine of motion within the Royal Society was Christopher Wren. He was the one who corrected Descartes' errors, laying down the foundation for a new field of studies. It provided the *virtuosi* with a general theory about the basic elements of nature, since collisions are seen to be the very origin of all the phenomena in a mechanically constituted universe. Joseph Glanvill, in the introduction to the *Scepsis Scientifica*, is even more daring in making the problem of finding the laws of matter in motion and the outcome of collisions the main purpose of the experimental activity of the Royal Society. The Society is seen as working towards 'the improving the minds of Men' so that they can go on and search for 'the true laws of matter and motion'. The general problem of formulating/discovering the laws governing the motion of bodies, seen as 'the foundation of Philosophie and all Philosophical discourse' (Oldenburg 1965–86, 5: 117–18) is, in many ways, another important Cartesian legacy to the Royal Society. This time, it is not a problem of Cartesian epistemology but one of Cartesian physics: is it possible to construct a coherent mechanical philosophy of bodies in motion based on the sole ingredients of geometry (Gaukroger 1980; Garber 1992)?

By claiming that 'there is absolutely nothing to investigate about this [extended] substance except those divisions, shapes, and movements' (Descartes 1991: 77) and that he can explain with the sole help of geometry all natural phenomena, Descartes had established the major questions behind the 'science of motion' in the seventeenth century: If the world is made of geometrical shapes in motion, how can we make sense of what seems to be body–body interactions? Where are the (active) (p. 229) powers that bring about changes in the natural world (Des Chene 2000: 144)?<sup>19</sup> And, more specifically, in what way can forces be ascribed to various bodies? Descartes speaks about forces of motion and rest, about bodies being 'stronger' and 'weaker' in an interaction, about resistance and *determinatio*, all qualities which, apparently, cannot be deduced from his own conception of physical bodies seen as shapes in motion. Or, if they can, the reconstruction involved is rather complex and implies a new mathematical approach (Jalobeanu 2007, 2002). In order to have a coherent account of reducing physics to geometry, Descartes is forced to claim that there is a way in which we can make sense of forces through pure mathematics (Descartes 1991: 64).

It has been repeatedly shown that Descartes' project for a mathematical physics was a failure. It failed to give a proper definition to a physical body, which, in Descartes' view, is no more than parts of matter moving together (at rest with respect to each other). It failed to give a definition of motion, which is considered to be both relative, and as belonging to a body.<sup>20</sup> It failed to explain the transference of motion from one body to another during collisions. It also failed to make the connection between the laws of nature and the behaviour of individual bodies in the encounters. And it formulated highly counterintuitive rules of collisions.

Although recognized as a failure, Descartes' proposal was highly influential. It appealed to mathematicians and philosophers alike, on both sides of the Channel. It postulated a simple and intelligible universe, where passive bodies defined with the instruments of the geometer follow universal laws. It promised to explain physical interactions with the sole help of geometry and quantities, without having to appeal to forces, occult qualities, or unintelligible entities such as substantial forms, active principles, etc.

In a certain sense, the mathematicians working on collisions and the doctrine of motion within the Royal Society of 1660s and 1670s were all Cartesians (Jalobeanu 2011). They all tried to deal with bodies in motion using the instruments of geometry and mechanics. In doing this, they also faced Descartes' major problem: finding a suitable operational definition of

bodies, a definition that would allow the project of a mathematical physics to take off. One way of doing this was by appealing to the instruments and conventions of mechanics or mixed mathematics, i.e. talking about bodies as abstract objects with a law-like behaviour and trying to use this law-like behaviour as the key ingredient of an operational definition.

## (p. 230) 9.6 Vanishing Bodies and the Birth of Modern Physics

Newton's most concerted attempt to find an operational definition of bodies in relation to space and motion is in the famous unfinished manuscript *De gravitatione et aequipondio fluidorum*,<sup>21</sup> and can stand as a very good example of talking about bodies from the perspective of mechanics. From the beginning, Newton explicitly places the discussion on bodies within the tradition of mixed mathematics: they are extended, impenetrable shapes, 'abstract figures in the same way that they are considered by geometers' (Newton 2004: 13).

Newton's project for finding an operational definition is very much in line with what we have seen above, in both the Cartesian approach and the Royal Society's accounts of collisions. What is needed is a way to ascribe a set of properties to a geometrical figure (or a portion of space), that is, a minimal set of properties allowing us to talk about motion, collisions, transfer of motion between such bodies, etc. (Jalobeanu 2007). However, Newton's account of bodies leading to the formulation of an operational definition is strikingly odd. It is disguised as a fable of creation, a hypothetical discourse on how God might have created matter using the pre-existent absolute space.<sup>22</sup> Newton emphasizes that any 'explanation' about the 'nature of bodies' is bound to remain conjectural because bodies 'do not exist necessarily but by divine will' and there are numerous ways in which they could have been produced. Consequently, the attempted explanation does not refer to bodies as they really are, but to 'a certain kind of being similar in every way to bodies, and whose creation we cannot deny to be within the power of God, so that we can hardly say that it is not body' (Newton 2004: 27). The actual account is an attempt to explain a possible way by which God may have created *in* space beings that differ in every respect *from* space. While absolute space is eternal, infinite, uncreated, uniform, immobile, passive, and imperceptible, Newton's 'bodies' (i.e. the 'kind of being similar in every way to bodies') are said to be 'opposite in every respect' (Newton 2004: 33). The difference between body and space, however, is solely grounded in the manner God created them: material bodies are said to be the product of God's action upon space. By making certain regions of space impervious/impenetrable *and* transferring the impenetrability in a law-like manner, God has created a 'phenomenon' the philosopher has to study. A body, therefore, is the effect of divine will produced in a determined quantity of space.

(p. 231) Thus we may suppose that there are empty spaces scattered through the world, one of which, defined by certain limits, happens by divine power to be impervious to bodies, and by hypothesis it is manifest that this would resist the motions of bodies and perhaps reflect them, and assume all the properties of a corporeal particle, except that it will be regarded as motionless. If we should suppose that that impenetrability is not always maintained in the same part of space but can be transferred here and there according to certain laws, yet so that the quantity and shape of that impenetrable space are not changed, there will be no property of body which it does not possess. It would have shape, be tangible and mobile, and be capable of reflecting and being reflected, and constitute no less a part of the structure of things than any other corpuscle, and I do not see why it would not equally operate upon our minds and in turn be operated upon, because it would be nothing other than the effect of the divine mind produced in a definite quantity of space. (Newton 2004: 28)

The story of creation and theological details aside, what Newton is struggling with here is an attempt to formulate a minimal operational definition of bodies having as a (minimal) list of attributes extension, impenetrability, mobility, law-like behaviour in collisions, *and* the capacity of affecting thinking minds.<sup>23</sup>

[W]e can define bodies as *determined quantities of extension which omnipresent God endows with certain conditions*. These conditions are: (1) that they be mobile, and therefore I did not say that they are numerical parts of space which are absolutely immobile, but only definite quantities which may be transferred from space to



space; (2) that two of this kind cannot coincide anywhere, that is, that they may be impenetrable, and hence that oppositions obstruct their mutual motions and they are reflected in accord with certain laws; (3) that they can excite various perceptions of the senses and the imagination in created minds. (Newton 2004: 28)

There are a number of striking aspects of Newton's account of bodies, even if we translate it in the rather anachronistic terms of 'finding a minimal set of properties for a good definition' I have used so far. First is Newton's claim that the origin of bodies is founded upon our capacity of moving (our) bodies (Newton 2004: 27, 29) and the analogical reasoning about the power God has in making regions of space impervious, while moving impenetrability from one part of the universe to another.<sup>24</sup> This suggests not only that what we have is a conjectural account, not only that bodies do not have the same kind of absolute reality as space or the geometrical objects, but a more striking empiricism. Certain regions of space look like bodies in relation to us: they are, for example, mobile and impenetrable to one another (but they are not absolutely impenetrable, since they coexist in the same space with our minds or with God's mind). They display a number of phenomenal (p. 232) aspects and properties that can be the subject of physical (and mathematical) investigation.

For whatever reality we believe to be present in bodies is conferred on account of their phenomena and sensible qualities. And hence we would judge these beings, since they can receive all qualities of this kind and can similarly exhibit all these phenomena, to be no less real, if they should exist in this manner. Nor will they be any less than substances, since they will likewise subsist and acquire accidents through God alone. (Newton 2004: 29)

Newton emphasizes the advantages of such a definition. It eliminates the traditional need for a substratum to explain *where* the said properties inhere. It helps us lay aside the prejudices of our childhood that bodies have an independent existence.<sup>25</sup> Instead, we can talk of a substantial reality of certain attributes, namely those attributes 'which are real and intelligible things in themselves and do not need to be inherent in a subject' (Newton 2004: 32–3). However, when enumerating such attributes, Newton distinguishes between space and motion on the one hand, and 'the power through which God can create things' on the other. Space and mobility of the parts can be conceived as having existence independent of any pre-existing substratum, and so is the latter attribute. However, we cannot have a clear idea about God's power and its effects, for we cannot form any idea of the power through which we move our bodies (Newton 2004: 33). As a consequence, there remains something fundamentally incognizable in our account about physical bodies.<sup>26</sup>

What we have gained, however, is a provisional operational definition of increased conceptual clarity and economy. There are side benefits too: the 'childhood prejudice' that bodies have independent existence is not only the source of conceptual confusions and disputations in philosophy, but, in Newton's view, it is *the* source of atheism (Newton 2004: 32).

The provisional operational definition of *De gravitatione* does not find its way into the *Principia*. However, it is not difficult to see that its formulation and subsequent explanations are wholly consistent with Newton's additions to the *Principia* and with the closing remarks of the 'General Scholium'.

There are other, more traditional approaches in Newton's writings which try to tackle the problem of the missing definition, for example, through formulating a matter theory. However, they do not find their way in Newton's major writings or in the Newtonianism of the eighteenth century.

## (p. 233) 9.7 Newtonianism and Beyond

If we turn now to the early eighteenth-century manuals of natural philosophy to measure the impact of what I have called the problem of the missing definition, even a cursory look will suffice to show that there is an abundance of operational definitions at work, mostly along the lines of the mixed mathematical approach. In the English translation of Jacques Rohault's manual, for example, bodies are figures set in motion:

I know it is here objected by some, that we ought not to stop at Figures, because they are not *active*. But though

they are not active in themselves, yet it is certain notwithstanding that their differences make Bodies, which we put into Action, capable of certain effects, which otherwise they could not have produced. (Rohault 1723, 1: sig. b2)

In what was probably the first course on Newton's mechanics, John Keill explicitly begins the discussion by claiming that the major source of error in natural philosophy was the confusion produced by the missing definition. Although philosophers claimed to cultivate mechanical philosophy, they were falling prey to countless conjectures and fictions regarding the microscopic constituents of bodies. So much so that 'there is scarce anything Mechanical to be found [in mechanical philosophy] besides the name' (Keill 1720: vii). Instead of looking for a 'subtle matter'<sup>27</sup> and all sorts of hypotheses to explain the corpuscular structure of bodies, natural philosophers should concentrate on geometry. All the errors of the Cartesians, Keill claims, spring from the fact that they were ignorant of geometry. As a result they could not know the forces of nature 'which can be only estimated by the means of geometry' (Keill 1720: viii). There could be no mechanical philosophy without geometry: in fact, for Keill, the second is entirely dependent on the first. The book introduces students to the principles of mechanical philosophy, namely the 'extension, solidity and divisibility of body' and 'the nature and properties of motion' (Keill 1720: ix). When it comes to formulating operational definitions of bodies, Keill is adamant that the only way we can formulate such definitions is with the help of mathematics. The nature of bodies is ultimately unknown; we should take as a body 'what is extended, solid and capable of motion' (Keill 1720: 11). Each of these properties can be explained. Extension is explained through the constructional procedure of the geometers, having surfaces, lines, and points as boundaries. Impenetrability is equated with solidity and it is said to be (p. 234) what distinguishes bodies from space.<sup>28</sup> The definitional properties of a body are conceived as 'opposite' to the properties of absolute space. We know that bodies exist because the properties of motion and impenetrability are 'repugnant to Space' (Keill 1720: 15).

In many ways Keill's manual departs from Newton's doctrine of space, time, and the nature of matter. Keill is careful to stick with a strict mechanical explanation and formulates sixteen axioms of the mechanical philosophy, including the ultimate passivity of physical bodies: 'Every Mutation induced in a natural Body, proceeds from an external Agent; for every body is a listless Heap of Matter, and it cannot induce any Mutation in itself' (Keill 1720: 80–1). The operational definition of bodies excludes properties such as internal forces, gravitation, or inertia. Such a move is not uncommon among the Newtonians. It follows Newton's own line of defence, trying to sweep under the carpet the unsolved foundational problems of Newtonian physics: the unknown cause/nature of gravity, the mysterious character of inertia, and the strange metaphysical structure of absolute space. A 'thin' operational definition of bodies in terms of extension, impenetrability, and mobility is seen by some of the Newtonians as solving, at least in part, some of the above problems. This is how another important name among the first generation of Newtonians, George Cheyne, defended his operational definition of bodies as resulting from the laws of nature/motion (Cheyne 1715: 2–3):

by the first law of nature and its corollaries, no kind of motion is essential to matter, and therefore Attraction or Gravitation cannot be essential to it; it is not a result from the Nature of Matter, because the efficacy of Matter is communicated by immediate Contact, and it can by no means act at a distance ... Besides, by the first Law of nature, Matter is entirely passive in its Nature, and can no more tend to, or draw other Bodies than it can move of it self; likewise supposing that Gravitation of the parts of Matter toward one another destroyed, yet still Matter wou'd be the same extended solid substance. Moreover, if there were but one indivisible part of Matter in being, it could not be said to have this Property it being a relative one, and having respect only to other Parts which it attracts; whereas impenetrability or any other of the essential properties of matter continues with it, ev'n when it becomes indivisible. (Cheyne 1715: 39–40)

Both Keill and Cheyne give operational definitions of bodies that exclude all forces or active powers and pose, therefore, serious problems for talking further about the development of the Newtonian dynamics in their treatises. Another solution, simpler from the point of view of doing physics, was adopted by 's Gravesande in his manual. His operational definition contains the familiar list of properties plus inertia, defined, however, as inactivity ('s Gravesande 1720, 1: 4–5). 's Gravesande's writings also contain extended discussions of the limits of natural philosophy (p. 235) and the unknown nature

of bodies. Physics is a branch of mixed mathematics and does not ‘meddle with the first formation of things’. What we can know are only some properties of bodies; in examining them we get acquainted with several laws describing their behaviour:

But then we are at loss to know, whether they flow from the Essence of Matter, or whether they are deducible from Properties, given by God to the Bodies the World consists of; but no way essential to Body; or whether finally those Effects, which pass for Laws of Nature, depend upon external Causes, which even our Ideas cannot attain to. (’s Gravesande 1720, 1: xii)

As a result, ’s Gravesande concludes, we know little in natural philosophy; but what we know is mathematically demonstrated, and therefore certain.

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## Notes:

(1) For a discussion of these additions and their significance see, for example, Stein 2002, Janiak 2008, Jalobeanu 2007.

(2) Problems connected with the nature of bodies arise in Newton's manuscripts fairly early. As early as his student notebook he was concerned with finding an explanation for how the parts of bodies unite to form wholes. See McGuire and Tamny 1983: 292–4. For the projected 'Conclusio' for the *Principia* see Newton 1962: 333.

(3) The number of commentaries on Aristotle, including Aristotle's books on the physical world, was larger in the sixteenth century than in the whole previous millennium (Lohr 1999: 286).

(4) *Philosophia naturalis (physica, or physiologia)* originally designated one of the three branches of speculative philosophy delineated by Aristotle alongside mathematics and metaphysics. Its place within the curriculum varied significantly from late Middle Ages to early seventeenth century. For a general picture of the scholastic background of seventeenth century see Tuck 1998; for a comprehensive article on the evolution of natural philosophy in sixteenth century see Blair 2006. For more detailed accounts of Aristotelianism in the Renaissance see Schmitt 1993 and 1983 and for the evolution of natural philosophy in late Scholasticism see Des Chene 1996.

(5) Leijenhorst and Lüthy (2002) claim that confessional factors played a substantial role in the acceptance and evolution of modern physical doctrines such as atomist theories of matter or a conception of a three-dimensional space. See also Lüthy 2001.

(6) Sometimes these powers were conceived as 'seeds' or *semina rerum* or *logoi spermatikoi* (see Hirai 2005).

(7) The philosophical landscape of the late scholasticism was extremely diverse, as it is clear from the recent and older surveys of Hirai 2005, Leijenhorst and Lüthy 2002, Lohr 1999, Ariew 1999, Schmitt 1993 and 1983.

(8) Even for an experimental philosopher like Robert Hooke, 'The business of Philosophy is to find out a perfect knowledge

of the Nature and Properties of Bodies, and of the Causes of Natural Productions' (Hooke 1705: 3).

(9) The discussion originates in a passage from Aristotle's *Physics* 187b 18–21; see Clericuzio 2000, Garber 2004, Ariew 1999. There are a number of interesting examples of Aristotelian 'atomists': Sebastian Basso, David van Goolle (Gorlaeus), and Daniel Sennert; see Clericuzio 2000, Lüthy 2001, Ariew 1999.

(10) Such as Francis Bacon, Nicholas Hill, or Daniel Sennert. For Bacon's adoption of Paracelsian doctrines see Rees 1975. For Sennert see Clericuzio 2000 ch. 1; for Hill see Garber et al. 1998.

(11) See Lüthy 2001 for a survey of Gorlaeus; Clericuzio 2000 for a number of examples within the tradition of *minima naturalia*; Leijenhorst and Lüthy 2002 for a couple of examples of Protestant Scholastics deriving atomism and a doctrine of empty space from a number of interesting changes at the level of metaphysics.

(12) For Cudworth, the atomist/atomical physiology is a doctrine resulting naturally if one applies one's reason in attempting to make the world intelligible. Historically it was the general philosophy adopted by all the ancients but was gradually corrupted either by external causes and contingencies or by mixing reason with passions, precipitancy, and prejudices (TIS: 27). Atomism is 'the Ancientest of all Physiologies, the Atomical or Mechanical, which alone renders sensible things intelligible' (TIS: 48). Cudworth claims that all ancient natural philosophy (Plato and Aristotle included) was 'Atomical or Mechanical', but gradually became corrupted (TIS: 50).

(13) Quantity is 'nothing else but divisibility' (Digby 1644: 9); a body is what has the capacity of 'being divided' (Digby 1644: 10).

(14) Digby also denies the possibility of a space independent of bodies and the interstitial void. See Garber et al. 1998: 567–8.

(15) Although corpuscularian in most of his physical explanations, Hobbes is an adversary of the atomists and formulates extensive arguments against the existence of void; on Hobbes' debates with Boyle and the partisans of the vacuum see Shapin and Schaffer 1985.

(16) In the earlier editions of the *Essay*, bodies are said to operate upon one another solely by impulse, while in the correspondence with Edward Stillingfleet Locke seems ready to admit the possibility of a Newtonian kind of action through gravitation. See Locke 1823, 4: 467–8. On Locke's account of bodies and action/force see Garber et al. 1998: 608.

(17) See for example *Christian Virtuoso*, B 5: 539–40, and BP, 9, fol. 30<sup>v</sup>.

(18) For a general survey of the debates over collisions in 1660s and 1670s in the Royal Society see A.R. Hall 1966 and M. Boas Hall 1991.

(19) On the problem of secondary causation in Descartes' natural philosophy see, e.g. Hattab 2000, Pessin 2003, Schmaltz 2003.

(20) See Gaukroger 1995 and 2002 for a contextual interpretation of this contradiction; see Garber 1992 for another definition of motion, not relative, but relational; cf. Des Chene 1996.

(21) For extended discussions of the content and dating of this very important manuscript see Palter 1987, Stein 2002, McGuire 1982, Janiak 2008.

(22) For conflicting interpretations of the status and importance of Newton's account see McGuire 1982, Palter 1987, Stein 2002. It is worth noting the striking similarity between Newton's fable/account of the creation and Descartes' fable of the creation/evolution of the world in *Le Monde*.

(23) Laws became constitutive for the definition of bodies, they are fundamental constituents of corporeal nature. See Stein

(24) Newton 2004: 30. In moving bodies we are ‘simulating the power of creation’. However, there is a fundamental analogy, ‘greater than has formerly been perceived by the philosophers’ between the act of will by which we move our bodies (according to the laws) and the act of will through which God creates (and moves) bodies in the absolute space.

(25) This is, in Newton’s view, the major cause for the traditional wrong use of the term ‘substance’ (Newton 2004: 32).

(26) Newton seems to leave open the possibility of further clarification of this account when we know more about our mind and its workings.

(27) The mechanical philosophers, Keill claims, ‘imagine they can explain all the phenomena of nature by matter and motion, by the figure and texture of the parts, by subtle particles, and the actions of effluvia: and they likewise contend, that these operations are brought about by the known and established laws of mechanics’ (Keill 1720: 3).

(28) Keill 1720: 13: ‘by this Property, Body is distinguished from another kind of Extension, which we conceive to be penetrable, which we call Space, and wherein we behold all Bodies to be placed and moved, at the same time regarding that as immoveable’.

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## The Theory of Material Qualities

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### Abstract and Keywords

This chapter examines the main theories of material qualities developed by leading British philosophers during the seventeenth century, describes the taxonomy of qualities during this period, and analyzes the epistemological and metaphysical theses that influenced the development of the theory of material qualities in Great Britain. It also considers the relevant works of Thomas Hobbes, Walter Charleton, Robert Boyle, John Locke, and Isaac Newton.

Keywords: material qualities, British philosophers, Great Britain, Thomas Hobbes, Walter Charleton, Robert Boyle, John Locke, Isaac Newton

THE early modern theory of material qualities was that part of the general theory of qualities that dealt with the nature and behaviour of material objects. As such it formed a central topic of early modern natural philosophy.<sup>1</sup> The seventeenth century saw the rejection of the hegemonic Aristotelian theory of material qualities and the entrenchment and detailed articulation of a radically different theory of qualities. This ‘new’ theory actually had a long and distinguished pedigree, finding its antecedents in the ancient Greek atomists Democritus and Epicurus. Yet it was developed and deployed in the seventeenth century with such vigour and enthusiasm as part of what was called the new philosophy, that it really did seem to many that the theory of qualities had been placed on an entirely new footing.

At the turn of the seventeenth century, hot, cold, wet, and dry were widely regarded as the primary qualities of material bodies: by the end of the century most natural philosophers were speaking of shape, size, and motion as the primary qualities. The Aristotelian primary qualities, which in late Scholasticism were the *explanans* for elemental change and for much qualitative change as well, were, by the middle of the seventeenth century, to be explained in terms of the ‘new’ (p. 241) primary qualities: the *explanans* had become the *explanandum*. This shift is, arguably, the most important development in the theory of qualities in modern philosophy and some of the major contributors to this new theory of qualities were British.

To be sure, it is important not to overemphasize the radical nature of this development or its pervasiveness: after all, there was widespread interest in Epicureanism in the late Renaissance as witnessed by Nicholas Hill’s *Philosophia Epicurea* of 1601. More importantly, however, recent trends in the study of late Aristotelianism have rightly emphasized the vitality and diversity of Aristotelian doctrines in the seventeenth century. And, while the treatment of particular themes and philosophers is still patchy, this scholarship has generally weakened the case for a radical discontinuity between the metaphysics of the late scholastics and that of the *novatores* such as Descartes, Hobbes, and Boyle (Edwards 2007). Furthermore, research in the history of early modern matter theories has revealed a vigorous corpuscular tradition in the late sixteenth and early seventeenth centuries in which the ‘new’ primary qualities played a significant explanatory role. In Britain this is to be found in the manuscript remains of a small informal network of eclectic philosophers called the Northumberland circle (Clucas

1997, 2001). In fact, even after the new theory of qualities had risen to ascendancy, the Aristotelian theory still retained a foothold. This is particularly true of those physicians who were wedded to the Galenic theory of health and disease that was predicated upon the Stagirite's theory of qualities. It was one thing for a natural philosopher to reject an entrenched theory; it was quite another for a physician to change his reasons for prescribing a particular regimen to his patients! (See Anstey 2011c.)

Nevertheless, the theory of material qualities does provide an important case study for those who continue to argue for the revolutionary nature of developments in natural philosophy in the seventeenth century. In Britain, arguments for the new theory of qualities were developed as much upon experimental grounds as they were upon philosophical argument. This is especially true of Robert Boyle.

Furthermore, while the main protagonists were all educated in scholastic philosophy, none of them engage with the complexity and diversity of opinion within late Aristotelianism in either their polemical engagement with scholastic doctrines or in the formulation of their own views. In particular, Hobbes, Charleton, and Locke show little interest in giving their scholastic opponents a patient and fair hearing. Each of them viewed their own theories of qualities as importantly discontinuous with the Aristotelian theory. Indeed, it is difficult to name even one leading British natural philosopher of the seventeenth century who defended the Aristotelian theory of qualities.

This chapter provides a chronological treatment of the main theories of qualities developed by the leading British protagonists that contributed to this process of change. It cannot presume to be comprehensive, for the subject is vast and involves many leading continental philosophers as well. But it does attempt to cover each of (p. 242) the salient philosophical issues involved. The chapter begins by providing a taxonomy of qualities in the seventeenth century, a taxonomy which itself illustrates some of the important changes that occurred with the advent of the mechanical or corpuscular philosophy in the 1640s in Britain. It then proceeds to examine the salient epistemological and metaphysical theses that were operative in the development of the theory of material qualities in Britain. These themes are illustrated with reference to some of the leading writers on the theory of material qualities: Thomas Hobbes, Walter Charleton, Robert Boyle, and John Locke. The chapter ends with a discussion of the implications of Isaac Newton's discovery of universal gravity for the theory of material qualities.

Before we proceed, however, a note about nomenclature is in order. Throughout this chapter the terms 'quality' and 'property' will be used as synonyms. This conforms, more or less, with standard usage amongst proponents of the new philosophy. The terms 'attribute', 'mode', 'accident', and 'affection' are also used within the theory of qualities, but these terms are not coextensive with the term 'quality'. They will be defined as the chapter proceeds.

## 10.1 Taxonomies of Qualities

In early modern philosophy the term 'quality' refers first and foremost to an ontological category. It is natural to ask with reference to material qualities whether there are different types of quality and, if so, what their relations are to each other. It is also natural to ask just what sort of things qualities are and how they are related to other ontological categories such as substance, mode, and relation. A theory of material qualities will give determinate answers to both of these questions.

In this section we will examine these questions in turn. In fact, our answer to the question about types of material quality sheds important light on the question as to how qualities are related to other ontological categories. It is through an understanding of the taxonomy of qualities in early modern philosophy that we can grasp the deeper question about the ontological status of material qualities in seventeenth-century British philosophy.

There were many schemes of material qualities in early modern Britain. No one standard schema or division among the qualities prevailed (B 6: 267–8). It is possible, however, to discern common characteristics in the various schemes of qualities that were discussed and then to use these common features as a benchmark against which to examine exceptions.



### (p. 243) 10.1.1 Epistemological Criteria for Distinguishing Material Qualities

Material qualities were distinguished and grouped according to epistemological and metaphysical criteria. Let us take the epistemological criteria first. In the early to mid-seventeenth century, the predominant distinction was that between first or primary qualities and secondary qualities. This distinction, deriving ultimately from Aristotle, is hierarchical. Certain qualities were considered primary because they have explanatory priority over other qualities. Thus, in the scholastic or Aristotelian theory of qualities, hot, cold, wet, and dry were the *primae qualitates* because they were used to explain all other material qualities. In particular, they explained the secondary qualities heavy, light, dense, and rare which, in turn, could be used to explain tertiary qualities and so on. This kind of hierarchical ordering of qualities was ubiquitous in early modern philosophy and it is in virtue of this that it is appropriate to speak of a taxonomy of qualities rather than merely a typology of qualities.

From the 1640s, with the advent of the new, mechanical philosophy in Britain, the traditional primary qualities began to be replaced by shape, size, motion, and texture and all the other qualities of bodies were to be explained by appeal to these qualities alone. Just as the Aristotelian theory developed within a tightly integrated natural philosophical system, so the primary qualities of the new philosophy emerged as an integral part of the mechanical philosophy and their primacy rested on views about the nature of natural philosophical explanation as much on disillusionment with the Aristotelian theory. As a consequence, many philosophers called these new primary qualities the mechanical affections, because they were the only features of matter that were required if one were to give a mechanical explanation of a 'non-mechanical' quality.

Returning to the Aristotelian theory, the primary and secondary qualities were also structured as pairs of opposites: hot/cold, wet/dry, heavy/light, and dense/rare. This ancient way of construing qualities gave the theory great explanatory power in so far as opposites were thought to be mutually incompatible and to resist each other. The pairs of opposites were used to explain change within material bodies and the dispositions to behave in particular ways. This explanatory power was utilized, for example, in the explanation of the nature of the material elements and in medicine. Thus, on the four element theory of matter that was widely accepted by philosophers, earth was cold and dry, water cold and wet, and so on. Again, the pairs of opposites played a crucial explanatory role in the maintenance of health in animal bodies. The primary qualities were the leading diagnostic and therapeutic determinants of health or illness and a doctrine of contraries was developed whereby therapies were devised which applied the contrary of the particular quality which was in excess.

(p. 244) Explanatory role was not the only epistemic criterion by which material qualities were distinguished and ranked. Qualities were also distinguished according to the degree of epistemic access that a percipient has to them. The most common distinction here was between manifest or sensible qualities and occult qualities (see Wilkins 1668). Manifest or sensible qualities were those to which the perceiver has immediate epistemic access, such as colour or shape. Occult or insensible qualities were those qualities of which we can perceive the effects but not the underlying causes. Magnetism and dormitive virtues were common examples of occult qualities. For many philosophers, however, occult qualities were not simply those which were inaccessible, they were also inexplicable. That is, they were not able to be explained by the first qualities, whether they be taken to be the *primae qualitates* of Aristotle or the primary qualities of the mechanical philosophy, namely, shape, size, motion, and texture. Thus, we find that a mechanical philosopher like Robert Boyle had no qualms admitting that there are occult qualities (see Hall 1987).

Among the sensible qualities a further epistemic criterion was often applied. Following Aristotle (*De anima* 418a, AR 1: 665), they were distinguished by those senses that were involved in their detection. The qualities which are detected by only one sense, such as colour, were called the proper sensibles, those detectable by more than one sense, such as shape, were called the common sensibles. Moreover, some philosophers maintained that there is a kind of hierarchy among the sensible qualities in virtue of the reliability of the senses involved in their detection. Aristotle had given pride of place to the sense of touch, which he regarded as the most reliable of all the external senses (*De anima* 413b–414a, AR 1: 658–9). It is hardly surprising then, that the first four qualities, hot, cold, wet, and dry, are all proper sensibles detectable by the sense of touch alone. Interestingly, there are remnants of the doctrine of common and proper sensibles and the Aristotelian preference for touch in the writings of British philosophers of the seventeenth century, even amongst those who rejected the Aristotelian

theory. Locke, for example, in the *Essay* has chapters on ‘Of the ideas of one sense’ and ‘Of simple ideas of divers senses’ (*Essay* II. iii and v). In fact, the common/proper sensibles distinction also provides another way to account for the fact that for those who held an Aristotelian-style theory of qualities, the proper sensibles hot, cold, wet, and dry were regarded as having priority or primacy over such common sensibles as shape, size, and motion.

### 10.1.2 Metaphysical Criteria for Distinguishing Material Qualities

Let us turn now to metaphysical criteria for distinguishing the qualities. On the Aristotelian view all material substances are a combination of the two principles (p. 245) matter and form. For proponents of this hylomorphic view, qualities were classified according to the form or essence of the objects in which they inhere. While the mechanical philosophers had very different accounts of essence and form from the Aristotelians, in both philosophies one finds the distinction between essential and accidental qualities. Essential qualities are those which a thing must have in order for it to be the kind of thing that it is. Accidental qualities are qualities that an object may possess, but which are not necessary for it to be the kind of thing that it is. An exposition of the distinction between essential and accidental qualities will, of course, require a prior clarification of the respective notions of essence and form within these rival approaches (see Anstey 2011b). A full exposition of the leading accounts of essential qualities in early modern British philosophy is beyond the scope of this chapter.

As for the relation of qualities to matter, early modern accounts of essential qualities and form were intimately tied to the kind of matter theory propounded by respective philosophers. We have seen how the Aristotelian primary qualities were used to explain the four element theory of matter, but what is evident from a survey of the range of British philosophers from the period is that, apart from the atomists and corpuscularians, there is a tendency to mix and match matter theories with theories of qualities. That is, among the range of matter theories on offer—the four element theory, Paracelsus’ *tria prima* of salt, sulphur, and mercury, and the Helmontian theory which gave primacy to water, to name the major players—there was no strict pairing of a particular matter theory with a particular theory of qualities. To be sure, the four element theory was normally accompanied by the Aristotelian theory of qualities; however, a number of physicians grafted the new theory of qualities onto the four element theory and some natural philosophers blended the Paracelsian or Helmontian matter theories with the new mechanical theory of qualities. Thomas Willis, for example, extended the *tria prima* to a pentad and yet deployed shape, size, and motion in his explanations of, say, fermentation (see *Of Fermentation* in Willis 1681).

Furthermore, in some writers one finds a blend of theories of qualities. For example, George Castle uses the primary qualities of the mechanical philosophy to explain the *primae qualitates*, while the latter retain their explanatory role in medicine (Castle 1667: 136–9). And even in a champion of the mechanical theory of qualities like Boyle, one finds accretions of the old Aristotelian theory, particularly in the terminology that they employ: all but one of his uses of the term ‘secondary qualities’ refer to Aristotelian secondaries. It is important to emphasize, therefore, that apart from the mechanical philosophers, there were no hard and fast divisions in the pairing of matter theories with theories of the qualities.

We saw above that the material qualities played an important explanatory role in natural philosophy. One important facet of this is the intimate connection between explanation and ontological reduction in early modern theories of qualities. According to the Aristotelian theory, a corollary of giving explanatory priority to (p. 246) the first four qualities over the secondary and tertiary qualities is that the secondaries are *reducible* to the primaries: all secondaries are reducible to hot, cold, wet, and dry. By contrast, the new theory of qualities of the mechanical philosophers inverts this ontological reduction. Following Descartes, they claimed that all qualities of bodies, and not least the *primae qualitates* of the Aristotelians, are reducible to shape, size, and motion. Indeed, one of the characteristic features of the new corpuscularian philosophy in Britain is its preoccupation with the mechanical origin or production of non-primary qualities and the discovery of hitherto unknown qualities of bodies.

### 10.1.3 Material Qualities and the Categories

We turn now to the question concerning how the qualities were understood in relation to other ontological categories. Here

again, Aristotle's metaphysics provided the terms of reference for all British philosophers of the seventeenth century. Most of them accepted Aristotle's fundamental division of being into substance and attribute. (Hobbes, however, is an important exception.) According to the Aristotelian view, substance has ontological priority in so far as it depends on no other entities for its existence. By contrast attributes, including qualities, are dependent entities in so far as they rely upon substance for their existence.

There is an important exception to this doctrine of attribute dependence. For, some Aristotelians posited that there is a special class of attribute, real qualities, which can exist in the absence of a substance. Originally this type of quality was required in order to explicate the doctrine of transubstantiation, though real qualities were quickly appropriated for other explanatory purposes. These real qualities became a serious point of contention for proponents of the new theory of qualities and were rejected outright by Descartes, Boyle, and Locke.

As for the attributes themselves, the scholastics followed Aristotle in dividing them into nine categories one of which was quality. The most obvious deviation from this division amongst proponents of the new philosophy was that many British philosophers followed Descartes in his appropriation of the category of mode from the metaphysics of the theologian Suárez.

Within the list of attributes, the category of quality was further divided into natural powers, habits, sensible qualities, and figure (*Categories* 9b25–10a25, AR 1: 15–16). It is not hard to find discussions of the qualities in British philosophy that follow this division, but what is striking is that from the 1660s it was not regarded as definitive, but rather survived as a useful tool for organizing schemes of qualities. As early as 1662 in the first edition of the Port-Royal *Logique*, Arnauld and Nicole, after listing the ten Aristotelian categories and the fourfold division of qualities, claimed:

(p. 247) these categories are viewed as based on reason and truth, when in fact they are completely arbitrary, having no foundation but in the imagination of one man ... others have included everything in the world, viewed from the standpoint of a new philosophy, in the following couplet:

*Mind, measure, rest, motion, position, shape:*

*Are with matter the beginning of all things.* (Arnauld and Nicole 1996: 34)

Here, without so much as an argument, the primary qualities of the new philosophy, along with mind and matter, are not merely conceived as a replacement for the *primae qualitates*, but for the whole Aristotelian theory of categories. Likewise, John Wilkins in *An Essay Towards a Real Character and a Philosophical Language* (1668), after listing a version of the Aristotelian divisions among the qualities, goes on to claim,

[w]hether many of those things now called *Quality*, be not reducible to Motion and Figure, and the Situation of the parts of Bodies, is a question which I shall not at present consider. (Wilkins 1668: 194)

Clearly Wilkins is prepared to use the traditional division for its comprehensiveness while admitting that it may not represent the true nature of the qualities themselves, which may be reducible to shape, situation, and motion.

Finally, there is one further means by which the qualities of bodies were partitioned in seventeenth-century British philosophy and this was by disciplinary domain. Many qualities were categorized relative to the discipline which examined them or which manipulated them. Thus, we find discussions of and orderings among the medical qualities and chemical qualities.

Now the 1640s was truly the critical decade for the uptake of the new mechanical theory of material qualities in Britain. While the new theory was elaborated and defended with greater rigour and philosophical acumen later in the century, it was through an intensive period of interaction with French philosophers in the 1640s that the decisive change was brought about. No doubt political events were the cause of the appearance of many English intellectuals in Paris at this time: the civil war in Britain and the exiled court in France meant that many with royalist sympathies chose self-imposed exile over the turbulent events at home. But this seems not to have dampened the exiles' appetite for new ideas. Again and again we find testimony

to the impact that the leading French philosophers had on the émigrés. For example, Sir William Petty reflected gratefully in 1674 that

your Grace [Cavendish, the Duke of Newcastle] doth not onely love the search of Truth, but did encourage Me 30 years ago as to Enquiries of this kind. For about that time in *Paris*, *Mersennus*, *Gassendy*, Mr. *Hobs*, Monsieur *Des Cartes*, Monsieur *Roberval*, Monsieur *Mydorge*, and other famous men, all frequenting, and caressed by, your Grace and your memorable Brother, Sir *Charles Cavendish*, did countenance and influence my Studies, as well by their Conversation as their Publick Lectures and Writings. (Petty 1674: sig. A8v–9v)

(p. 248) That influence on Petty's study is revealed in his letter in 1649 to the philosopher Henry More in which he claims, 'Monsieur des Cartes hath indeed made use of sensible principles such as are Matter, Locall Motion, Magnitude, figure, situation &c. so that when hee speakes, it is possible to understand what he means, & therin hee is much to be prefer'd before the common schoole philosopher' (Webster 1969: 367). Likewise the physician John Twysden, an early associate of Boyle, spent time in Paris in the 1640s and later claimed, when grappling with the utility of the new theory of qualities for physic, that atomism 'was revived by *Gassendus*, a learned Philosopher and Divine, ... whom my self had the honour particularly to know, and frequently converse with there [at Paris], and often about this subject' (Twysden 1666: 138).

## 10.2 Thomas Hobbes

The most philosophically able of the British exiles in France in the 1640s was Thomas Hobbes (1588–1679) and it is most likely that Hobbes was the first British philosopher to develop a natural philosophy that included a broadly mechanical theory of material qualities as an alternative to the scholastic theory. Certainly by October 1636 he held a mediumistic theory of light and a subjectivist view of colour, namely, that it is merely an effect of 'motion in the brayne' (Hobbes 1994, 1: 38). Hobbes' mature natural philosophy was developed in the 1640s and finally appeared in 1655 as *De Corpore*.

This extraordinary work is the first fully-fledged natural philosophy of seventeenth-century Britain. It is a kind of hybrid with a Galilean agenda (Jesseph 2004) and a quasi-Cartesian conception of matter, all presented with some deference to Aristotle. Hobbes' starting point is an alternative conception of substance whereby this fundamental category of being is identified with material body and its subsisting in itself, a defining characteristic of Aristotelian individual substance. Hobbes says,

The definition, therefore, of *body* may be this, a *body is that, which having no dependance upon our thought, is coincident or coextended with some part of space*. (DCo VIII. 1)

One might infer from this that Hobbes believes that body exists in space, but in the broader context of this passage and the previous chapter space is dismissed as any sort of category of being and relegated to a phantasm of the mind, that is, the imaginary space commonly found in scholastic metaphysics (DCo VII). (In fact, it was only around 1648 that Hobbes came to deny the possibility of vacua and to affirm that the world is a plenum; see Malcolm 2002: 189–96). Thus, for Hobbes, all that exists is body and its attributes. Moreover, 'body' here refers only to material (p. 249) extension, for as he had already claimed in *Leviathan*, '*Substance incorporeall* are words, which when they are joined together, destroy one another' (*Lev.* 34: 270). For Hobbes 'incorporeal substance' is an oxymoron and the term 'material quality' is a case of periphrasis: the theory of qualities just is the theory of material qualities. Let us turn then to Hobbes' account of qualities.

Hobbes' preferred term for the qualities is 'accident' and they play a central role in the elaboration of his natural philosophy. There is, however, no systematic presentation of the nature and role of accidents in *De Corpore*, and the reader is left to piece together Hobbes' view from various disparate passages within the work. According to Hobbes, there are four things to which we give names: bodies, accidents, phantasms, and names themselves. Only bodies can have accidents: there are no accidents of accidents (DCo V. 2). Accidents cannot be detached from body and are, therefore, non-transferrable from one body to another (DCo VIII. 21). Moreover, while Hobbes is not explicit about the matter, his denial of universal things

probably implies a denial of universal accidents. For Hobbes then, all bodies and accidents are particular: only the names of bodies and accidents can be universal, not the things themselves (*DCo* II. 9)

Like Aristotle, Hobbes is committed to non-mereological composition for accidents: accidents are not parts of bodies. The colour red is not a part of the red body in the way that red blood in a cloth is part of the cloth (*DCo* VIII. 3). But Hobbes' example here is apt to mislead, because red is not strictly an accident of bodies, but a phantasm of the mind. What then are the objective accidents? Here the waters are a little muddy in Hobbes' account. He does not present a consistent inventory of the objective accidents of bodies. Sometimes he gives primacy to extension or magnitude. He claims that magnitude is never created or destroyed (*DCo* VIII. 14, 20), whereas all other accidents are; that '*magnitude* is the peculiar accident of every body' (*DCo* VIII. 5); that magnitude is the only accident of prime matter (*DCo* VIII. 24). But he also says that magnitude and *figure* are inseparable from all bodies because bodies cannot be conceived without them (*DCo* VIII. 3) and that all bodies have '*magnitude, motion, rest, action, passion, power, possible, &c*'. (*DCo* XI. 1). However, this list is unclear because it omits figure, because he elsewhere defines 'action' and 'passion' in terms of motion, and because it is not clear what other accidents might be encompassed in his 'et cetera'. Moreover, in another passage he claims that motion, rest, colour, and hardness are not possessed by all bodies (*DCo* VIII. 3). A clever exegete may be able to rescue Hobbes from these seeming inconsistencies, but there is a deeper problem in Hobbes' theory of accidents.

When discussing the phenomenon of change, Hobbes claims that body or material substance, can neither be created nor destroyed, but that all accidents are created or destroyed, with one notable exception, magnitude or extension. Magnitude is an immutable accident (*DCo* VIII. 21). In fact, change is merely the generation or destruction of accidents in the agent and patient (*DCo* IX. 1). All (p. 250) change, that is, every case of the generation or destruction of accidents, is brought about through the motion of bodies (*DCo* IX. 9). Motion is the only efficient cause: formal and final causes are reducible to efficient causes (*DCo* X. 6). The generation and destruction of accidents accounts for sameness and difference among bodies (*DCo* XI). But how are sameness and difference among bodies perceived? This brings us to Hobbes' account of the relation between accidents and phantasms and on this point Hobbes' natural philosophy appears incomplete.

He claims that accidents are 'powers of action' by which bodies work on our senses (*DCo* III. 3). Accidents are powers to create conceptions or phantasms in us. In fact, we can only apprehend bodies through these phantasms and a large part of the study of natural philosophy is the determining which accidents are merely phantasms and which are objective features of bodies (*DCo* VI. 8). The sensible qualities light and colour are merely phantasms in the mind (*DCo* XXV. 10). But what are phantasms in the mind? *Ex hypothesi* they are merely matter in motion. According to Hobbes 'sense is nothing else but the action of objects propagated to the furthest part of the [sense] organ' (*DCo* XXV. 10; cf. XXV 2). However, at various points Hobbes speaks as if ideas and conceptions are different to matter in motion: he speaks of a distinction between phantasms and objective accidents, in effect a distinction between primary and secondary qualities; he speaks of motion in the brain causing phantasms as if phantasms are an effect, or epiphenomenon, of matter in motion; he even speaks in compositional terms of conceptions such as gold which comprises 'ideas of *solid* visible, heavy' (*DCo* VI. 4) and man which comprises 'figure, quantity, motion, sense, reason, and the like'. Yet Hobbes gives us no account of the subject that has these 'complex ideas'. Rather, on his sparse ontology such phantasms can only be matter in motion and, therefore, equivalent to their causes. Hobbes provides no criterion by which one can distinguish between phantasms and their causes over and above spatio-temporal location: phantasms are in the brain and their distal causes are in the world.

Furthermore, on Hobbes' account there is no principled way of distinguishing between phantasms of bodies in motion and phantasms of sensible qualities such as colour: both are merely bodies in motion in the brain. This leads to a third problem for Hobbes' account of phantasms, namely that there is a yawning explanatory gap between the phenomenology of sensible qualities and their natures as bodies in motion. Even if our phantasms of colour and sound are reducible to matter in motion, what is it that accounts for the fact that we do not experience them as motions but as colours and sounds? Hobbes' account of sensible accidents leaves the phenomenology of our experience of colour and light unexplained.

Surprisingly, Hobbes' *De Corpore* seems to have had little impact in Britain; however, Hobbes' general materialism and its



incipient atheism were widely discussed and criticized, particularly by the Cambridge Platonists Henry More and Ralph Cudworth (see e.g. More 1659).

### (p. 251) 10.3 Walter Charleton

Walter Charleton (1620–1707), the royalist physician, was the first British philosopher to publish a full-blown theory of material qualities. Strongly influenced by philosophical developments in France of the 1640s, he seems to have settled on a Christianized form of atomism after briefly flirting with Helmontianism and Cartesianism in the early 1650s. His theory of qualities, which occupies more than half of his *Physiologia* (1654), is highly derivative from the philosophy of Pierre Gassendi, but it nonetheless sets out the main contours that subsequent theories, like that of Robert Boyle, were to cover.

Charleton's theory of qualities is predicated on atomism. First he sets out the essential and inseparable proprieties (properties) of the material principles, i.e. atoms. In so doing, he distinguishes between the general and specific properties (roughly the distinction between determinables and determinates). Then he treats of the origin of qualities and proceeds to discuss individual sensible qualities and occult qualities. Finally, he applies the theory to the processes of generation, corruption, and alteration.

Throughout Charleton's terminology is not entirely consistent, but neither is it problematic. He uses the term 'quality' both for the attributes that characterize atoms and for the attributes that are derived from atomic concretions such as the sensible qualities (Charleton 1654: 111). He uses the term 'propriety' in a more restricted sense to refer to the necessary attributes of the material principles (atoms) and for the attributes of concretions which give rise to all the other qualities, such as sensible qualities. He also speaks of occult proprieties (1654: 343) but never of sensible proprieties.

The general (determinable) properties of atoms are 'consimilarity of substance'; magnitude (size); figure (shape); and gravity (the cause of motion) (1654: 111–12). These properties are essential and inseparable from atoms. The specific (determinate) properties are the particular sorts of figure, etc. that atoms possess (1654: 112). The number of different figures is indefinite and the number of atoms of each figure is infinite (1654: 117). Common accidents such as position, order, and number arise when concretions of atoms are formed, but these are not inseparable properties of the material principles themselves.

Charleton, naturally enough, shows some conceptual confusion concerning gravity and mass or bulk. He claims that gravity is the primary cause of motion, that bodies can have different gravity, and yet all (unimpeded) bodies move through the void at the same speed (1654: 112). Having established the properties of atoms and their concretions he turns in Book Four to the origin of qualities and to detailed treatments of individual qualities. He defines 'quality' as follows:

By the *Quality* of any Concretion, we understand in the General, no more but that *kind of Appearance, or Representation, whereby the sense doth distinctly deprehend, or actually discern the same, in the capacity of its proper Object.* (1654: 128)

(p. 252) The ensuing discussion confirms that this is a subjectivist theory of sensible qualities. Charleton stresses 'the necessary Incompetence of any sensible Quality to the Material Principles' (1654: 130)—atoms are not coloured, smelly, etc.—and that the particular *quale* is produced in its respective organ of sense as a result of the figure, order, and situation of the atoms that constitute perceptible objects: 'if we confine our assumption only to these three Heads, *Figure, Order, and Position*; we shall yet be able, without much difficulty, to make it out, how from them ... an infinite Multiplicity of Qualities may be created' (1654: 131).

Turning next to occult qualities, that 'ill-contrived Sanctuary of Ignorance', Charleton attempts to 'lance and cleanse this Cacoethical Ulcer' by first setting out some general laws of nature: (1) every effect has a cause; (2) motion is the only cause; (3) no action at a distance. These are, in effect, explanatory principles which delimit the range of possible

explanations of phenomena whose causes are insensible, such as magnetism. Thus,

The means used in every common and Sensible Attraction and Complection of one Bodie by another, every man observes to be Hooks, Lines, or some such intermediate Instrument continued from the Attrahent to the Attracted; and in every Repulsion or Disjunction of one Bodie from another, there is used some Pole, Lever, or other Organ intercedent, or somewhat exploded or discharged from the Impellent to the Impulsed. Why therefore should we not conceive, that in every Curious and Insensible Attraction of one bodie by another, Nature makes use of certain slender Hooks, Lines, Chains, or the like intercedent Instruments, continued from the Attrahent to the Attracted, and likewise that in every Secret Repulsion or Sejunction, she useth certain small Goads, Poles, Levers, or the like protruding Instruments, continued from the Repellent to the Repulsed bodie? Because, albeit those Her Instruments be invisible and imperceptible; yet are we not therefore to conclude, that there are none such at all. (1654: 344)

There is no need to take the exposition of Charleton's views any further, for the theory lacks innovation and philosophical depth. However, there is a certain vivacity in his idiosyncratic style which some readers have found engaging. Just how influential his views were is unclear. Gassendi himself desired a copy of the book (Hobbes 1994, 1: 214), but there is little evidence that the work had any influence on Boyle (*pace* Kargon 1966, ch. 9) or Locke. Neither of them mentions the *Physiologia* in his writings and the work is not among the four works by Charleton in Locke's library.

## 10.4 Robert Boyle

Robert Boyle (1627–1691) wrote extensively on the theory of material qualities, developing his own theory in conjunction with his corpuscular matter theory. His account of the qualities of bodies is best understood within the broader methodological context of the experimental philosophy.

(p. 253) From the 1660s a new set of terms of reference in natural philosophy emerged in Britain. This was the distinction between experimental and speculative philosophy (Anstey 2005). Experimental philosophy emphasized the priority of observation and experiment in the acquisition of knowledge of nature and decried the use of hypotheses and speculation based upon first principles and maxims. It was also opposed to premature system building in natural philosophy. The main way that this new experimental philosophy was practised from the 1660s until the end of the century was according to the Baconian method of natural history. This method involved the collections of vast numbers of observations about particular substances, qualities, states, and processes. Only after the completion of the natural history of a particular subject, a task that would take generations, were natural philosophers able to begin the theoretical or speculative part of natural philosophy.

Boyle was the leading experimental philosopher and exponent of Baconian natural history in England until his death in 1691 (Anstey and Hunter 2008). He was also the leading philosopher of the qualities. William Wotton, for example, in his *Reflections upon Ancient and Modern Learning* (1694), nicely illustrates the widespread impact of Boyle on the development of the new theory of qualities:

*Fire*, as it appears to our Senses, seems to be a Quality, rather than a Substance; and to consist in its own Nature, in a Rapid Agitation of Bodies, put into a quick Motion; and divided by this Motion, into very small Parts. After this had been once asserted by the *Corpuscularian* Philosophers, it was exceedingly strengthened by many Experimental Writers, who have taken abundance of Pains to state the whole *Doctrine of Qualities* clearly, and intelligibly; that so Men might know the difference between the Existence or Essential Nature of a Body, and its being represented to our Senses under such or such an Idea. This is the Natural Consequence of proceeding upon clear and intelligible Principles; and resolving to admit nothing as conclusive, which cannot be manifestly conceived, and evidently distinguished from every Thing else. Here, if in any Thing, the old Philosophers were egregiously defective: What has been done since, will appear by consulting, among others, the Discourses which



Mr. Boyle has written upon most of the considerable Qualities of Bodies. (Wotton 1694: 243)

Most of Boyle's writings about the qualities of bodies are natural historical works written under the Baconian rubric (as Wotton goes on to point out; 1694: 244). A nice example is *Cold* (1665) whose subtitle is *An Experimental History of Cold Begun*. But Boyle also developed a speculative natural philosophy that featured a theory of qualities. The most important statement of his theory is found in the *Origin of Forms and Qualities* (1666/7) which contains both a speculative part and an extended 'historical' part, nicely illustrating the way in which Boyle believed that the experimental and speculative aspects of natural philosophy could mutually support each other.

Boyle was fully apprised of the Aristotelian theory of qualities (it is nicely represented in a diagram in his student notebook; see Principe 1995: 60) and its recent rivals in the writings of both the atomists and chymists. (He wrote an entire (p. 254) tract against the chymists' doctrine of qualities; B 8: 389–405.) He was also well aware of the plethora of schemes of qualities that were proposed and accepted the arbitrary nature of the various divisions among the qualities. His theory, however, did have one fundamental division and in order to elucidate this we need first to set out the core doctrines of his theory of matter.

According to Boyle there is one underlying homogenous matter which is extended and probably has the essential affection of impenetrability (B 5: 333; 8: 308). This matter is divided into bodies which are themselves constituted by imperceptible corpuscles. It is constitutive of the corpuscular philosophy that it is uncommitted on the question of the infinite divisibility of matter and the existence of vacua (B 2: 87–8) and Boyle's matter theory should be seen as a *via media* between Cartesianism and atomism.

Moreover, Boyle's matter theory was developed using an Aristotelian substance/attribute ontology, such that material substances are a combination of an underlying substance or substratum and attributes (B 5: 308–9). Following Descartes, Boyle includes among the attributes the Suaresian modes of matter, shape, size, and motion. These are the inseparable affections or catholic 'moods' of all individual corpuscles. However, Boyle emphasizes an additional mode, that of the primary concretions of single corpuscles, namely texture. Texture is the structural arrangement of the constituent parts of the primary concretions that make up the basic chemical substances that we find in nature. Thus, texture is a mode of matter, though single corpuscles lack it (B 5: 333–4).

The modes of matter are called the mechanical affections or catholic affections of matter (B 5: 333). They are (almost) never called qualities because they are the basic ontological category from which all the material qualities derive. So, according to Boyle, shape, size, motion, and texture are not primary qualities, but are the affections from which all the qualities arise (B 8: 116). When he uses the term 'first quality' it is always with reference to the Aristotelian primaries, hot, cold, wet, and dry (e.g. B 6: 270; 10: 345). It is, therefore, semantically incorrect to claim that Boyle adhered to a primary and secondary quality distinction. And yet he was the first to introduce the term 'secondary quality' in the sense soon to be popularized by Locke, to refer to the qualities of bodies derived from the shape, size, motion, and texture of the constituent parts of material bodies (B 5: 317). Thus, with the benefit of hindsight, we can see that Boyle and Locke effectively used the same distinction, though they expressed it differently.

Turning to the qualities themselves, in his speculative philosophy Boyle was particularly concerned with the ontological status of the sensible qualities, including those with a dispositional nature and those that appeared to be relational in nature. Yet in spite of his many discussions of these issues, it seems unlikely that any definitive view can be extracted from his writings (Anstey 2000, ch. 4). But Boyle was not merely concerned with the status of qualities in his speculative philosophy; he also had very definite views on the manner in which the material (p. 255) qualities have their origin in the mechanical affections of bodies. In his experimental natural philosophy he went to great pains to establish the mechanical origin of qualities, and it was this combination of Boyle's speculative natural philosophy and his experimental or historical writings that led many to believe that he had established the theory of qualities on a new footing (Wotton 1694: 243).

As William Newman has shown (Newman 2006, ch. 7), the basic argument form for the mechanical origin of qualities was

the reduction to the pristine state (*reductio in pristinum statum*). The inference to the best explanation concerning chemical processes in which a substance is put into solution and then reduced to its original state is that there is an underlying primary concretion, with a determinate corpuscular structure, which retains its nature throughout the process. This was the central empirical argument for Boyle's claim that the qualities and behaviour of chemical substances were better explained in terms of an essential corpuscular structure than by Aristotelian forms. But Boyle could use an analogous argument for the claim that the sensible qualities of chemical substances proceed from the texture of the constituent parts.

The first experiment in the 'historical part' of *Forms and Qualities* provides an excellent example. By dissolving white, strong-smelling camphor in clear oil of vitriol (sulphuric acid) Boyle created an odourless liquid that was a deep yellow colour. Then, by adding water 'in a trice, the Liquor will become pale, ... and the Camphire ... will immediately disclose itself, and emerge, in its own nature and pristine form' (B 5: 395), that is white and odorous again and all of this without the use of heat. Boyle concludes from this that changes in the smell and colour of the camphor, which retains its nature in solution, are solely the result of the changes of texture as the various corpuscles are differently juxtaposed. There is no doubt that Boyle took this to satisfy his aim in *Forms and Qualities*, viz.

That then, which I chiefly aime at, is to make it Probable to you by Experiments, ... That allmost all sorts of Qualities, ... *may* be produced Mechanically, I mean by such Corporeall Agents, as do not appear, either to Work otherwise, then by vertue of the Motion, Size, Figure, and Contrivance of their own Parts, (which Attributes I call the Mechanicall Affections of Matter ... ). (B 5: 302)

## 10.5 John Locke

What Boyle called the mechanical affections—shape, size, motion, and texture—are now known as the primary qualities. The philosopher who effected this change was John Locke (1632–1704). Locke was a close friend of Boyle and was positively disposed both to Boyle's experimental philosophy and his more speculative views. (p. 256) Although Locke was more circumspect about the truth of corpuscularianism than his esteemed compatriot, it is clear that it plays a central role in his elaboration of his famous distinction between primary and secondary qualities and his hopes for increased knowledge of the relations between the qualities of bodies: 'I have here instanced in the corpuscularian Hypothesis, as that which is thought to go farthest in an intelligible Explication of the Qualities of Bodies' (*Essay* IV. iii. 16; see also Downing 1998).

As we have seen, a primary and secondary quality distinction is adumbrated in Boyle, but it was Locke who developed the doctrine into the relatively stable form that became the high-watermark of the theory of material qualities in the seventeenth century. Locke's distinction has simpler nomenclature than that of Boyle, clearer distinguishing criteria between the qualities, and is predicated upon a sophisticated theory of ideas and corpuscular matter theory. It was Locke's distinction and not that of Boyle, that was to be attacked in the eighteenth century by Berkeley and Hume and endorsed by Thomas Reid.

The centrepiece of the doctrine is the pair of distinguishing criteria between the qualities. The first criterion for Locke is that the primary qualities are 'utterly inseparable from the Body, in what estate soever it be ... and such as Sense constantly finds in every particle of Matter, which has bulk enough to be perceived, and the Mind finds inseparable from every [insensible] particle of Matter' (*Essay* II. viii. 9). This inseparability criterion can be traced back to Greek atomism and on the face of it, sounds plausible enough. There is, however, a serious problem of internal consistency here with Locke's nominalism and his theory of abstraction. Let me explain.

Clearly it is the determinables that Locke has in mind in his statement of the inseparability criterion, for all objects, including even invisible particles, might have different determinate shapes and sizes. Locke is making a conceptual point, namely, that the determinable qualities of shape, size, and motion are constituents of our very notion of material body: we can conceive of a body lacking colour, taste, and smell, but we cannot conceive of a body lacking shape, size, or mobility (McCann 1994: 61). What is not clear, however, is whether he really intends to attribute objectively existing determinable properties to material

bodies. If he does, his conceptual point about determinable primary qualities would be inconsistent with his view, expressed elsewhere in the *Essay*, that all substances are particular and all properties are determinate. For, in Books Three and Four of the *Essay* Locke is adamant that when we form abstract ideas of say human or shape, these ideas do not imply objectively existing objects or properties in the world (*Essay* III. iii. 9–12): just as there is no average Australian in the world, neither is there any general, or determinable triangle in the world (*Essay* IV. vii. 9): there are only determinate shapes.

Now Rob Wilson has argued for an interpretation of Locke's inseparability criterion that might be used as a way of mitigating this potential inconsistency. He has claimed that Locke underplays the conceptual point in the inseparability criterion and (p. 257) instead that Locke provided an abductive argument for the primary qualities in this passage. Locke's argument, according to Wilson, is founded on the implicit explanatory principle that we ought only posit universal qualities at the unobservable level that are universal at the observable level. Thus, when Locke speaks of qualities 'such as Sense constantly finds in every particle of Matter, which has bulk enough to be perceived, and the Mind finds inseparable from every [insensible] particle of Matter', Wilson claims that he is really arguing that 'whatever qualities are universal among *sensible* bodies ... are thus qualities that all insensible bodies have, and thus are qualities that *all* matter has' (Wilson 2002: 208).

In support of Wilson's interpretation, it does appear that Locke is implicitly committed to Boyle's Familiarity Condition on natural philosophical explanation (Anstey 2011a, ch. 8). This is the condition that *all explanations of the unobserved must be in terms of properties and causes with which we are familiar* (see e.g. B 5: 351–2). Wilson's interpretation of Locke on the inseparability of primary qualities is entirely consistent with this more general principle. It is merely the Familiarity Condition applied to universal qualities. There is a problem, however, and that is that on Wilson's 'transductive' interpretation of Locke's inseparability criterion gravity qualifies as a primary quality. Yet Locke's view that gravity is a superadded quality of all matter is based on his claim that such a power is 'above what can be derived from our idea of body' (Locke 1823, 4: 467–8). Locke's claims about gravity seem to push us back to the conceptual point interpretation of the inseparability criterion. Thus, we are left with a nasty dilemma. If we interpret the inseparability criterion as a conceptual point that implies a commitment to objective determinables in bodies, the criterion appears inconsistent with Locke's nominalism: whereas if we interpret it as an abductive argument, it is inconsistent with Locke's claims about gravity. Perhaps Locke's second distinguishing criterion is less problematic?

The second distinguishing criterion is that of resemblance: 'the *Ideas of primary Qualities of Bodies, are Resemblances* of them, and their Patterns do really exist in the Bodies themselves; but the *Ideas, produced* in us by these *Secondary Qualities, have no resemblance* of them at all' (§15; cf. §7). Note here the importance of the theory of ideas. There is a set of ideas of the qualities of bodies that resemble the actual qualities that produce, or cause, these ideas. These are the primary qualities. There are other ideas caused by the qualities of bodies that do not resemble their causes at all. These causes are the secondary qualities. And Locke has a psychological explanation of their apparent similarity (or our difficulty in perceiving the difference between these two sorts of qualities), and hints at a metaphysical explanation of the actual difference between them. Like Descartes before him, Locke claims that we are inclined to project (Locke uses the word 'impute': §22) our ideas of secondary qualities onto the objects themselves (§24–5). In effect, Locke is committed to a kind of projectivist theory of the phenomenology of secondary qualities. (The view of some (e.g. Mandelbaum 1964: 21) that, for Locke, (p. 258) the secondary qualities are ideas in the mind has been decisively refuted by Hill and Milton 2003.)

Moreover, the resemblance criterion is explained by the fact that the secondary qualities: 'are in truth nothing in the Objects themselves, but Powers to produce various Sensations in us, and *depend on those primary Qualities, viz.* Bulk, Figure, Texture, and Motion of parts' (§14). Locke's claim here is that secondary qualities are nothing but powers. This does not entail, as some interpreters have claimed (Rickless 1997; Jacovides 2007) that primary qualities are therefore *not* powers. It is simply to claim that there is nothing more to secondary qualities than that they are 'Powers to produce various Sensations in us'. The implication is that there is something more to the primary qualities and Locke is explicit that this is the fact that they are real qualities.

By ‘real quality’ Locke means not simply the determinate qualities that ‘really exist’ in bodies (‘The particular *Bulk*, *Number*, *Figure*, and *Motion* ...’, §17), that is, objectively exist independently of observers, but also qualities that are not ‘barely, and nothing but Powers’ (§24). Locke seems to be claiming that primary qualities are not bare powers in virtue of the fact that they do not depend on and are not caused by anything more fundamental. Secondary qualities are bare powers in so far as they arise from the underlying primary qualities of the corpuscular structure of the object that possesses them; primary qualities are the ontological grounds of secondary (and tertiary) qualities. Thus, in contemporary parlance, Locke’s primary qualities are the categorical ground of the secondary qualities. Furthermore, Locke seems to accept that, like the secondary qualities, primary qualities can cause ideas of qualities in us. In his definition of ‘quality’ he says: ‘a Snow-ball having the power to produce in us the *Ideas* of *White*, *Cold*, and *Round*, the Powers to produce those *Ideas* in us as they are in the Snow-ball, I call *Qualities*’ (§8; cf. §22). Thus, from the perspective of the contemporary theory of properties we might say that Locke has a dual-side account of primary qualities (once held by C.B. Martin; Molnar 2003: 149–53) in so far as they have a categorical and a dispositional side, whereas he has a purely dispositional account of secondary qualities.

## 10.6 Conclusion

It was stated above that Locke claimed that unlike our ideas of shape, size, and motion, the notion of gravity cannot be derived from our conception of body. Indeed, once he had accepted Newton’s discovery of universal gravity Locke was forced to concede that gravity is somehow superadded to all matter by God. Locke’s concession here provides a nice illustration of a fundamental and lasting shift in the (p. 259) epistemic status of the theory of material qualities in the late seventeenth century. In the opening decades of the century the predominant Aristotelian theory of qualities was integrated into a close-knit metaphysical and natural philosophical package that faced off against its philosophical rivals on the grounds of internal consistency and explanatory power. By the time of Boyle in mid-century, natural philosophical arguments had come to play a central role in establishing the case for the new theory of the mechanical origin of material qualities. By the 1690s, however, the theory of material qualities had become subservient to the latest discoveries in natural philosophy. The scandal of Newton’s gravity was not simply that it was inexplicable according to the principles of corpuscularianism and the mechanical philosophy. It was scandalous because these speculative theories, which for decades had been boasting their superior intelligibility, now had to bow to the authority of the new experimental natural philosophy through which universal gravity was discovered.

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## Notes:

(1) For a recent and comprehensive treatment of the general theory of qualities in early modern philosophy up to Locke, see Part V of Pasnau 2011.

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## Theories of Generation and Form

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## Abstract and Keywords

This chapter examines the convention concerning the theories of generation and form in the field of natural philosophy in Great Britain during the seventeenth century. It explains that natural philosophers treated the questions of biological generation interchangeably with those coming from chemistry, mineralogy, and meteorology, and considers Antoine Goudin's argument that there are both efficient and final causes at work in the earth's production of rocks that resemble animals or parts of animals. The chapter also suggests that the 'chymists' were consistently presented as a challenging third party, alongside Aristotelianism and traditional atomism, in the effort to account for the composition of natural bodies.

Keywords: theory of generation, theory of form, natural philosophy, Great Britain, biological generation, Antoine Goudin, chymists, Aristotelianism, traditional atomism, natural bodies

THE problem of generation, at its broadest, concerns the way in which entities that at one time do not exist, later do. The generation of animals is just one instance of this problem, as are the coming-into-being of minerals, plants, volcanoes, and other features of the natural environment; planets, stars, and the cosmos itself. In any given domain there are three possible solutions to the problem: (i) to hold that nothing ever really comes into being, but only emerges out of a new arrangement of pre-existing material parts; (ii) to hold that nothing ever really comes into being, but is always itself pre-contained in the world in a hidden form; (iii) to hold that new creatures come into being as a result of the imposition of some new form on matter, either, in turn, as a result of God's direct intervention (as in the traditional Christian account of human embryogenesis), or as a result of the transition of a previously merely potential form to actuality. One might adopt one of these solutions for one domain, and different solutions for another: for example, one might hold that the generation of humans involves the supernatural creation of a soul by God in, say, the fourth month of gestation, while in contrast the 'generation' of a volcano is really just the rearrangement of already existing earth. But in general, for those entities to which natural philosophers have traditionally wanted to ascribe some substantial reality, or reality over and above the parts that compose them, only the second or third solution would do.

(p. 262) We may accordingly see the problem of generation as consisting, at least in part, in the following set of fundamental questions: What things are such that their being cannot be accounted for in terms of the mere rearrangement of things in the world? If their being is not due to such rearrangement, then how can we account for the fact that they do not appear always to have existed? Have they in fact always existed, but in a manner unknown to us? And how could the other option—that they are supernaturally created at a given moment—be tenable if one is committed to the view, as so many seventeenth-century British philosophers were, that everything in the world unfolds according to rigid mechanical laws?

In this chapter, we will follow what appears to have been the convention in most natural philosophical writing of the early

modern period, in treating questions of ‘biological’ generation interchangeably with those coming from chemistry, mineralogy, meteorology, etc. How do actually existing things come into being? That is the salient question, whether it concerns humans, frogs, chemical compounds, or comets. Often indeed, biological generation is taken as the model of generation in general. This is a commonplace that does not begin with British philosophy. Consider the Dominican author Antoine Goudin’s account of the origins of fossils. In his *Philosophy, Following the Principles of Saint Thomas*, Goudin argues that there are both efficient and final causes at work in the earth’s production of rocks that resemble animals or parts of animals. Their efficient cause is a sort of cooking brought about by exhalations from the depth of the earth that makes the strata where fossils are found into a furnace of sorts. Their final cause, in turn, is

a certain force earth itself possesses variously, following the different places in which the mixed body is formed. This force, similar to the maternal bosom from which animals arise, assuredly plays a great role in the formation of these bodies; this is why, according to Aristotle and Saint Thomas, earth and water furnish to everything arising from the bowels of the earth their matter and bosom, as would a mother, while heaven and the stars fulfill the office of the father, who imparts the form. (Goudin 1864 [1668]: 301)

Now, one might interpret this parallel that Goudin is drawing between mineralogenesis and embryogenesis as an analogy, just as for example one might call God the ‘architect’ of the world. But one might by contrast understand it as a hypothesis about how minerals or fossils come into being. There is no *prima facie* reason why they should not literally be generated in this way.

There is also no reason why we should suppose that historically the key concept of ‘seed’ has been circumscribed, as it is for us today, along biological lines. In the past, ‘seed’ functioned largely as a hypothetical principle of inception, and was generally not thought to be the sort of thing whose existence might need to be empirically established at all. In Aristotle, to cite a prominent seed theorist, the animal semen is only the material vehicle of an immaterial form, and as such simply dissipates once the form is transmitted to the female’s uterus. Such a conception of seed might, in fact, be deemed necessary for anyone who wants to (p. 263) steer clear of a materialist conception of generation, or of any conception that veers too close to a reduction of generation to mere alteration.

Broadly speaking, in addition to the Aristotelian theory, there are two other traditions of thinking about seeds, and so inevitably about generation, that will play a role in the early modern period. The one begins in the Epicurean tradition, passes through Lucretius, and enters the modern world through Pierre Gassendi, Walter Charleton, and others, positing invisible clusters of atoms that develop into the familiar kinds of qualitatively diverse natural things in the world. The other is rooted in the Stoic tradition, and enters the modern world through Paracelsus, Joan Baptista van Helmont, and others, conceiving of seeds in the vitalistic and abstract sense of *logoi spermatikoi*, immaterial principles scattered throughout the natural world that are prompted to develop at different points in time (Emerton 1984; Clericuzio 2000; Hirai 2005). The various seed theories of the seventeenth century followed in one of these traditions, or, which is more common, mixed elements of all three of them. Indeed, with many thinkers it is difficult to determine in which sense they themselves understood the notion of seed, and this is particularly true of the generally very eclectic natural philosophers in seventeenth-century England.

Let us now seek to chart the most prominent theories of generation in English philosophy of the seventeenth century, as well as some of their immediate continental antecedents, paying particular attention to the way in which they are positioned relative to the three possibilities outlined above.

## 11.1 From Paracelsus to Bacon

For the Swiss physician Theophrastus Philippus Aureolus Bombastus von Hohenheim, better known as Paracelsus (1493–1541), it is sooner the case that biological generation is to be understood on analogy to a chemical operation, than vice versa. Thus he writes that ‘the mother and parent of all generation has always been, even from the very beginning, separation’

(1922–1933, 13: 393). As Newman explains, Paracelsus envisioned processes ‘ranging from the digestive system’s separation of nutrient from excrement to the creative act of God himself in terms of distillation and the removal of slag during the refining of metals’ (Newman 2006: 45). For Paracelsus chemical and metallurgical operations are the *point de départ* for understanding a wide variety of other phenomena in nature and beyond, from physiology to theology.

Paracelsianism, often identified with Rociucrucianism and natural magic, was harshly rejected in France in the early seventeenth century. Thus, for example, Gui (p. 264) Patin writes to André Falconet in 1655 of the new edition of Paracelsus currently being published in Geneva, that it is a great shame that such an author finds a press in Switzerland to print him, adding: ‘I would prefer that they had published the *Alcoran*, which is not as dangerous, and which, at least, would not lead as many people astray’ (Patin 1846, 3: 47; cited in Margolin 1993: 408).

In England, the situation could not have been more different: Paracelsianism pervaded much of the thinking about the fundamental constitution of the natural world and about the nature of change and generation, though it did so as a loose web of beliefs rather than as a doctrine that one would be compelled to accept or reject wholesale. Paracelsian ideas first seem to have entered into England in connection with debates over the use of inorganic compounds in the treatment of illnesses. Traditional Galenists preferred only herbal remedies, and thus were—as Thomas Nashe sarcastically characterized the Paracelsian opinion of tradition—like dogs, ‘who when they are sick eate grasse’ (Nashe 1594: sig. E–Eii; cited in Nicholl 1984: 199). The Paracelsians in contrast, or in addition, saw the key to health as lying in powders, oils, acids, salts, and various mixtures of these. Many in England took a keen interest in the medical application of Paracelsian chemistry, while rejecting some of its more grandiose and outlandish objectives, such as chrysopoiesis or the transformation of base metals into gold. Thus John Hester writes in his preface to the second part of Paracelsus’ *Secrets of Physick and Philosophy*, published in English in 1633, that ‘it seemeth unreasonable that a man in so short time should doe that thing which nature doth in many yeares. And that men should presume to doe that which God doth only himself, and not any of his creatures’ (Paracelsus 1633: 107; cited in Debus 1965: 68).

While the transmutation of metals was largely sidelined in the work of many English authors, one of the more ambitious elements of the chemical tradition remains evident in the English reception of Paracelsian iatrochemistry, namely, the idea, or the hope, that medicine might discover the secret to long life, and perhaps even to eternal youth. Indeed, it is in Francis Bacon’s (1561–1626) interest in the prolongation of life, particularly in his *Historia vitae et mortis* of 1623, that we see this seminal modern thinker’s clearest debt to the Paracelsian tradition. For Bacon as for Paracelsus, there are spirits permeating any body, including the human body, and death occurs when these spirits exit the body. The vital spirits, Graham Rees writes, ‘regulate all vegetative functions of plants and animals ... These functions flow from the spirit’s airy-flamy constitution’ (OFB 6: lviii). The search for a means of prolongation of life is thus a practical endeavour to control a certain kind of spirit found in a certain kind of natural body. Longevity, as Stephen Gaukroger has observed, is also a point where ‘two sets of concerns central to Bacon’s project met: the renewal of human dominion over nature, and the establishment of natural philosophy as an archetypically practical discipline’ (Gaukroger 2001: 95).

Now of course, Bacon’s interest in the continuation of life might seem distant from our main interest here, the origin of life and of form, but as some of the (p. 265) thinkers we will consider further on reveal, the difference between the generation and preservation of living beings might not in fact be all that great. Yet there are other, significant points of contact between the Paracelsian tradition and the work of Bacon. For one thing, Bacon adopts the Paracelsian view that particles have distinct properties that may be identified with *naturae simplices* (Fattori 1982: 67; Clericuzio 2000: 79). These basic ingredients may be thought of as small bodies conceived on the example described in Aristotle’s *Physics* (Book I, ch. 4) as a ‘natural minimum’, rather than as an atom. It is not an indivisible body, but rather, simply, the smallest amount of any given kind of thing that is required in order for that thing to remain the sort of thing it is.

For Bacon, the basic requisites of a physical body of a certain type also have what he identifies as ‘schematism’ or ‘configuration’, as he writes in Book I, aphorism 51 of the *New Organon*:

We should rather focus on matter, its schematisms and metaschematisms, and the pure act and the law of that act

or motion. For forms are fictions of the human soul, except when you want to call those laws governing the acts forms. (OFB 11: 89)

Bacon believes that there are configurations that are visible, but the more subtle ones are beyond inspection, and it is only by presumption that they are describable in terms of arrangements of particles. In any case, until the subtler arrangements of particles are exhaustively delineated, one should not move on, Bacon thinks, to more problematic properties of bodies such as affinities or sympathies: ‘we cannot hope for much concerning the investigation of consents before we have made headway with the discovery of forms and schematisms [*Schematismorum*] (OFB 11: 431). In Book II, aphorism 51 of the same work, Bacon goes on to express an uncertain view of the possibility of transmutation of metal, and the terminology he uses to express this again recalls his identification of configuration and texture, and of these with the determination of a given thing’s kind:

But whether there be any means of changing bodies *per minima* (as they call it), and of transposing the subtler schematisms of matter (an affair relevant to all manner of corporeal transformations, so that art can do in short order what nature does by beating about the bush) of all this I have so far no sure guidance. (OFB 11: 443)

In other words, it is an open question whether a body’s basic kind can be changed by a swift manipulation of its *minima*, as would presumably happen when a base metal is transmuted into gold. The subtle configuration, or schematism, of a body has to do with its rarity or density, and this is something that, as Clericuzio has well noted, ‘changes according to the proportion of spirits’ (Clericuzio 2000: 79). The attribution of a role to spirits—broadly conceived as an ethereal body that is capable of differing degrees of rarity and density, and that is inherently active—in natural changes, including generation, is one that set the chemical tradition sharply apart from traditional atomism. One of the more influential pneumatic (p. 266) theories in the context of seventeenth-century English natural philosophy was that of the Belgian physician Joan Baptista van Helmont (1580–1644).

## 11.2 Van Helmont and the Maturation of English Iatrochemistry

Although van Helmont falls outside of the national scope of the present *Handbook*, his work was very influential in England, so he is perhaps worth brief consideration (for an excellent and comprehensive account of van Helmont’s seed theory, see Hirai 2005, especially ch. 17). The Flemish doctor’s masterwork, *Ortus medicinae*, was published posthumously in Amsterdam in 1648, thanks largely to the efforts of his son, the kabbalist and physician Franciscus Mercurius van Helmont. This work was then translated into English and published in 1662 under the title *Oriatrike, or, Physick refined*. This work would help to consolidate the influence of ‘Helmontian chemistry’ in England, and many prominent thinkers writing around this time, including Robert Boyle, would, while not fully identifying with van Helmont’s views, nonetheless feel the need to define themselves in relation to them.

The starting point of Helmontian chemistry is the view that there are two principles of generation: water, or the material principle; and semina, or the spiritual principle (Clericuzio 2000: 19). Van Helmont says of water and seminal principles that ‘the framing of these two natural causes at least, do abundantly suffice’ for the production of natural beings. ‘I acknowledge two onely Sexes’, he reasons in a Renaissance fashion, ‘so also are there two bodies at least, the beginnings of any things whatsoever, and not more’. He argues that both the four element doctrine of the Aristotelians as well as the Paracelsian doctrine of the *tria prima*—‘Salt, Sulphur and Mercury, or Salt, Liquor and Balsam’—cannot ‘obtain the Dignities of beginnings’ (van Helmont 1662: 30–1).

Van Helmont believes, as we have seen, that everything comes from a seed, including humans, animals, plants, minerals, and metals. Yet not everything that arises in this way is a substance in its own right, with *essentifica quidditas* or, as the English translation of the *Ortus* puts it, ‘essentificall thingliness’. Rather ‘the Seeds of things that are not soulified, are indeed propagated no otherwise than as light taken from light’ (van Helmont 1662: 30). Separating a projected light into a split beam,

for example, does not bring into existence two distinct luminous beings, and the same is the case with the generation of the lower kinds in nature. ‘Minerals and Vegetables’, van Helmont explains, ‘if by any condition, they may seem to live, since they live onely by power, and not by a living form in light enlivened; they may also fitly be defined by their matter alone’ (van Helmont 1662: 30). Thus the crucial (p. 267) ontological boundary in nature is drawn between minerals and plants on the one hand, and animals and humans on the other, since ‘while from the causes of Minerals or Mettals, a stone doth re-bound, or from the Seed of a Plant, while a Plant is made: no new Being is made’. He thus concludes that ‘power is given to the Earth of producing Herbes: but not to water of producing Fishes’ (van Helmont 1662: 30).

It is a central conviction of van Helmont’s generation theory that ‘beings have nothing from themselves for generating, but do possess all things from a borrowing, and freely’ (van Helmont 1662: 133). He maintains that ‘a living Creature doth not generate a living Creature, but the seed well disposed to a living Creature’. Instead, it is God who is directly in charge of each generation, and in this connection van Helmont harshly denounces that familiar Aristotelian adage, ‘Man is begotten by man and by the sun as well’ (*Physics* 194b 13, AR 1: 332), arguing that to believe as much ‘is a shamefull thing ... Because it is that which is stuffed with the Idiotisme or proper form of speech of Heathenisme’ (van Helmont 1662: 146). The seed for van Helmont is not so much ‘the maker of the form’ as it is ‘the disposing Master-Workman’ (van Helmont 1662: 133).

The ‘Archeus’, for its part, or force that guides the development of the seed, is, van Helmont maintains, borrowed ‘from the thing generating, not the form, yea nor the light of life wherein the form shineth’ (van Helmont 1662: 133). It is a generic force that stimulates development without for that being able to guide development into a particular being of a particular kind or other, ‘[f]or the *Archeus*’, van Helmont explains, ‘cannot give that which he hath not, neither hath he that which is far narrower than his own nature’ (van Helmont 1662: 145). Therefore, he continues,

the Creator doth enlighten or illustrate the *Archeus* with a light of specificall essence or thingliness, after an unutterable manner, and also co-knits it into the unity of a composed body: And there is in the sensitive creatures a Soul, or sensitive life: therefore in its moments of maturity, and period of appointment, the brutall conception is soulified with a specificall formall light (van Helmont 1662: 145)

How a creature becomes a creature of a particular sort is for van Helmont ultimately a mystery, attributable only to God’s impenetrable will. The ‘specificall formall light’ given by God at a particular moment of development saves each ‘brutall conception’ from developing into a mere *mola*, a sort of nondescript, unorganized bit of biomass.

The notion of *Archeus* would play an important role in the philosophy of a number of van Helmont’s English successors, particularly the Cambridge Platonist Henry More. Shortly, we will turn to the legacy of van Helmont’s two-principle theory in the work of the most influential English chemist of the seventeenth century, Robert Boyle (1627–1691). But first let us consider some of Boyle’s immediate predecessors in the very heteroclitic school of what might be called English (p. 268) qualitative corpuscularianism, as well as in the various movements that sought to reinvent the legacy of Aristotle for distinctly modern ends.

## 11.3 Aristotle’s Enduring Influence

William Harvey (1578–1657) is the most important English generation theorist in the time period we are considering, but also something of an outlier relative to the others. His training was in Padua, and in many respects he remains, even after his return to England, more in conversation with the members of that important Italian school of physiology, and particularly with his mentor Hieronymus Fabricius d’Acquapendente (1537–1619), than with his compatriots. While best known for his discovery of the circulation of the blood, Harvey also published an important work on generation, entitled *Exercitationes de generatione animalium*, in 1651. In this work, he argues ‘that *all* animals, even the viviparous, and even man himself, emerge *ex ovo*; that their first conceptions, from which foetuses are made, are *ova* of a certain kind’. The same is true, he says, of plants, concluding ‘[t]herefore the natural history of the *ovum* has a wider significance, since through it the modus of

every kind of generation is illuminated' (Harvey 1651: 2).

But Harvey's commitment to the *ex ovo omnia* doctrine does not commit him to the view that every creature pre-exists in the form of an egg. Quite the contrary, in generation theory, Harvey is perhaps best known for his defence of epigenesis (as well as his invention of this term): the view that foetuses develop through the successive addition of parts. Epigenesis is a complex theory, but for our purposes it will be useful to highlight just one aspect of Harvey's view, which he retains from the Aristotelian tradition, and which sets him sharply apart from most of his English contemporaries: the complete rejection of both preformation and pangenesis, together with a view of the seed substance as simple and uniform throughout.

Preformationism in the strict sense would not become a prominent theory of generation until the 1670s (and would from there come to reign until the mid-eighteenth century), while pangenesis had been an influential view, and one that seemed to threaten a materialist reduction of generation, since the ancient period. According to this latter view, the new creature is generated from fragments gathered from all of the parts of its parents. This theory was available in many ancient variants, including Hippocratic and Anaxagorean, but Aristotle, who was its greatest ancient opponent, identified it mostly with Democritean atomism. Aristotle had worried that in a Democritean cosmos, atoms might be able to become entangled and cling to one another, but that they could never, as Simplicius reports of Aristotle's view, 'form one substance ... in reality of any kind whatever; (p. 269) for it is very simple-minded to suppose that two or more could ever become one' (Kirk, Raven, and Schofield 1991: 425–6; Smith 2006: 4).

As Walter Pagel highlights, the most important contrast for Harvey is between epigenesis and metamorphosis. In the latter 'the whole is divided *into* parts and thus differentiated', while in epigenesis 'the whole is composed and constituted *from* parts in a certain order' (Pagel 1967: 234). Harvey believes that the common mistake among other generation theorists is that they 'seek for the cause of diversity in the parts of matter', that is, assuming that this soft organ must originate from that bit of soft matter, that bone must originate from that bit of hard matter, and so on (Pagel 1967: 234). Harvey follows Aristotle, explicitly against the atomist school as well as, implicitly, against the chemical school, in maintaining that generation cannot simply be 'separation, aggregation or composition of things' (Pagel 1967: 234). In his research on the formation of the chick in the egg, his aim is to show that all of the parts of the chick develop out of the same homogeneous albumen, a fluid substance entirely lacking in parts, and entirely undifferentiated. As we will see shortly, a similar account will be promoted by more than one of Harvey's English successors.

As mentioned, another prominent English Aristotelian of the seventeenth century was Kenelm Digby, who, in his 1644 *magnum opus* entitled *Two Treatises. In the one of which, the Nature of Bodies, in the other, the Nature of Mans Soule; is looked into: in way of Discovery, of the Immortality of Reasonable Soules*, sets out to describe 'the ordinary processes which we see in bodies and in bodily things (that is, by the vertues of rarity and density, working by locall motion)' (Digby 1644: 204). Digby believes (like Leibniz and many others in the era) that the greatness of Aristotle must not be judged through the lens of the scholastic philosophy that had distorted his true teaching. He thinks, in particular, that the Stagirite's doctrine of four elements can be exhaustively understood in terms of 'the notions of *Quantity*' (1644: 30), while the qualities of compounded bodies can in turn be exhaustively accounted for in terms of the elementary quantitative differences between the basic constituents of matter.

As is also the case with many of his contemporaries, the real obstacle to full-blown, quantitative atomism arises in attempting to account for biological generation. Echoing a common theme, Digby describes living entities as a special sort of 'engine':

But there are ... bodies in which this manifest and notable difference of partes, carrieth with it such a subordination of one of them unto another; as we can not doubt but that nature made such engines (if so I may call them) by designe; and intended that this variety should be in one thing; whose unity and being what it is, should depend of the harmony of the severall differing partes, and should be destroyed by their separation. As we see in living creatures; whose particular partes and members being once severed there is no longer a living creature to be found among them. (Digby 1644: 205)

(p. 270) 'Now of this kind of bodies, there are two sorts', Digby goes on, namely, plants and animals. The first kind includes



‘those that seem to be one continuat substance’, he notes, which is to say that plants are the sort of living being that is not, or is only minimally, separated into distinct subsystems or organic parts, ‘so that the operation of one part is not at all different from that of an other: but the whole body seemeth to be the course and throughfare of one constant action’ (Digby 1644: 205). Next Digby moves on to animals. These have their parts,

so notably separated one from the other; and each of them have such a peculiar motion proper unto them, that one might conceive they were every one of them a complete distinct totall thing by it selfe ... were it not, that the subordination of these partes to one an other is so great, and the correspondence between them so strict, (the one not being able to subsist without the other, from whom he deriveth what is needfull for him; and again, being so usefull unto that other and having its action and motion so fitting and necessary for it, as without it, that other can not be:) as plainly convinceth that the compound of all these severall partes must needes be one individuall thing. (Digby 1644: 205)

While Digby hopes to be able to give an account of the development of living creatures in purely thermomechanical terms, he is most confident of his ability to do this with respect to the growth of plants and seeds. Thus he asks his reader to ‘frame a conception, that not far under the superficies of the earth, there were gathered together divers partes of little mixed bodies, which in the whole summe were yet but little’. He then supposes ‘that this little masse had some excesse of fire in it, such as we see in wet hay, or in muste of wine, or in woort of beere’. Under the proper circumstances, Digby argues, ‘the small encrease of bulke made in the masse by the swelling of it ... could not be hindred by the pressing of the earth, though lying never so weightily upon it’. And from here the end result—an upward-growing plant—follows as if it had been guided by an end-driven principle from the outset, while, in fact, the plant only grows upward ‘because the resistance is least that way ... , as also by reason that the upper part of the earth lyeth very loose and is exceeding porous, through the continuall operation of the sunne and falling of raine upon it’ (Digby 1644: 209).

But a sensitive creature or animal, Digby thinks, is to a plant as a plant is to a mixed body, since ‘you cannot but conceive that he must be compounded as it were of many plants, in like sort as a plant is of many mixed bodies’. In other words, the plant is relatively homogeneous throughout, Digby thinks, or not further analysable into subordinate subsystems or organs. It consists only in the composition of several mixed bodies that are not themselves fulfilling any particular organic function in the plant. The animal, in turn, is constituted out of several ‘plants’, or several parts that are each in turn composed out of several mixed bodies. But so that ‘all the plants which concurre to make one animall’ are ‘of one kind of nature and cognation’, Digby thinks, ‘the artificer which worketh and mouldeth it, must be more active’. Thus ‘we must suppose that the masse, of which an animall is to be (p. 271) made, must be actually liquid: and the fire that worketh upon it, must be so powerfull that of its owne nature, it may be able to convert this liquide matter into such breathes and steames, as we see do use to rise from water, when the sunne or fire worketh upon it’ (Digby 1644: 210–11).

Digby denies the pangenetic theory and, in an apparently new argument against it, invokes what he takes to be the reality of spontaneous generation:

[I]t is evident that a sensitive creature may be made without any such gathering of partes beforehand from an other of the same kind: for else how could vermine breed out of living bodies, or out of corruption? How could ratts come to fill shippes, into which never any were brought? How could froggs be ingendred in the ayre? Eeles of deewy turfes, or of mudde? Toades of duckes? (Digby 1644: 215)

What we would call insect metamorphosis constitutes for him yet another argument against pangenesis: ‘[W]hen one species or kind of animal is changed into another; as when a catarpiller or a silkworme becometh a flye; it is manifest that there can be no such precedent collection of parts’ (Digby 1644: 215). If there is not a ‘precedent collection of partes’, however, this is because the creature develops from a seed, one that does not have all of the parts of the future creature already articulated in it, but that, in some unexplained way—much as was the case for Boyle’s unseen primary concretions—has the necessary arrangement to develop, through the proper series of external causes, into the kind of creature of which it is a seed.



Digby expends much energy to show how, from the starting point of ‘so mean a principle’ as a seed, ‘so excellent a creature [as a plant or animal] can derive its origine’. However, he maintains that

if we examine it in retayle [i.e. detail], and go along anatomising it in every steppe and degree that it changeth by; we shall find, that every immediate change is so neere, and so palpably to be made by the concurrent causes of the matter prepared; as we must conclude it, cannot possibly become any other thing than just what it doth become. (Digby 1644: 217)

He implores his reader to ‘[t]ake a beane, or any other seede’, and put it into the earth. When it begins to rain, Digby asks, ‘can it then choose but that the beane must swell? The beane swelling, can it choose but breake the skinne? The skinne broken, can it choose (by reason of the heate that is in it) but push out more matter, and do that action which we may call germinating?’ (Digby 1644: 217). And so on. At first glance, Digby’s attempt to account for generation in terms of a series of fortuitous external causes looks to be exactly what the English naturalist John Ray would deride, some decades later, in his *Wisdom of God Manifested in the Works of His Creation* of 1691. Ray argues here that generation

is so admirable and unaccountable that neither the Atheists nor Mechanick Philosophers have attempted to declare the manner and process of it; but have (as I noted before) very cautiously and prudently broke off their Systems of Natural Philosophy here, and left this (p. 272) Point untoucht; and those Accounts which some of them have attempted to give of the formation of a few of the parts, are so excessively absurd and ridiculous, that they need no other Confutation than *ha ha he*. (Ray 1691: 217)

Indeed, many of Digby’s English successors would find even seed-based mechanical embryogenesis implausible, and would return, as Ray thinks we must, to immaterial principles of development that not only serve as a general motor of development, but also guide that development in such a way that the parts arrange themselves in a way that yields a creature of some particular kind or other.

One such successor of Digby was Nathaniel Highmore (1613–1685), who wrote his 1651 *History of Generation* (which he dedicated to Robert Boyle) principally as an argument against the generation theory spelled out in Digby’s *Two Treatises*. Highmore sets himself up early on in this work as an opponent of the ancient four-element theory, and happily draws on evidence supplied by chemistry to argue that ‘in the dissolution of all mixt Bodies’, there are ‘other Elements besides those four, we received from the Ancients’. Aristotle’s four, Highmore thinks, are simply too limited to account for the qualitative variety of nature, ‘[f]or indeed how can we imagine that the complicated and reiterated mixture of heat, & cold, moisture and drought, should ever produce those ridling effects of Mercury, the Loadstone, and many others’ (Highmore 1651: 2). Highmore does not seem to consider the possibility that Digby promotes, namely that the correct interpretation of Aristotle’s theory does not reduce the four elements to pairs of qualities.

Highmore believes that there are primordia that develop into macroscopic living entities, writing of pollen that ‘in every parcell of this dust, the nature of the whole resideth, as it were contracted into a small quantity’ (Highmore 1651: 9). He maintains that generation is ‘performed by parts selected from the generators, retaining in them the substance, forms, properties, and operations of the parts of the generators’ (Highmore 1651: 26). He identifies these selected parts in explicitly chemical terms as ‘the *Quintessence or Magistery* [that] is called the *seed*’ (Highmore 1651: 26). Highmore believes that the seed consists in two parts: material atoms, and a spiritual form which animates and directs these. This form is ‘proper to that species whose the seed is’, and is responsible for eventually making the new creature ‘such a creature as it is’ (Highmore 1651: 27–8).

Thus Highmore, unlike Digby, does not believe that pollen or any other seed on its own, or in interplay with external natural forces, is capable of giving rise to a mature plant. He maintains that ‘if heat rarifying a substance, making it thrust it self into a larger space were the sole author of all generation’, were the cause why the stalks of plants grow upward, and their roots downward, then ‘we must either admit those differing Characters to be vain accidental chances, or else look out some other agent, from whose fruitful womb, this variety might spring forth’. The problem, Highmore thinks, with attributing generation

and development to heat and other such accidental chances is not that by these we could never get a mature (p. 273) plant, but that we could not get the regular reproduction of this or that particular kind of plant. Highmore continues:

If we but muster over the numerous Regiments or several species of Plants, and consider how this grows up with a square stalk, that with a round; some start up hexangular, others triangular; some bear a fruit of one form, some of another: and in them fashion seeds, of as differing figures as themselves. How the leaves also and flowers shew as much of variety, as skill in the Workman; every Plant being by them as soon discern'd, as seen. (Highmore 1651: 13–14)

The same problem arises for animals as for plants. Heat or fire, Highmore maintains, working on a homeogeneous body, cannot 'give it any other heterogeneous parts then fiery ones'; moisture, similarly, can give only moist parts. Thus, Highmore reasons, we might come to understand how external causes might 'accidentally ... give hardnesse to bones, and softnesse to flesh; but how comes this bony substance in this place blady, in that round, in another long? this Muscle round, that triangular? ... We must seek out some other agent to fashion these parts' (Highmore 1651: 37).

In a fascinating new twist on the ancient comparison of the microcosmic animal body with the cosmos, Highmore points out that if in fact animals were formed simply through the expansion of heat, as Digby had contended, they would expand in a simple circular motion and would take on the same shape as the celestial spheres:

If this formation of Creatures arise from heat extending, and enlarging a small moistned lump; without any other consideration, why are not these Atomes extended circularly; and so all Bodies should be cast into the same Mould with the Heavens; and should, as they seem to us, be all sphericall. (Highmore 1651: 14)

In other words, if the growth of living bodies were really just a matter of expansion through the interaction of heat and moisture, then the result would be a world of warm, moist, living spheres, rather than the complex arrangement of interworking parts into the quadrupeds, avians, etc., that we in fact observe.

Highmore's account of spontaneous generation explicitly draws on a theory of subordinate forms, which may be traced back, again, to chemical thinkers such as Daniel Sennert, and which recent scholars have identified as influential in the theory of monads of G.W. Leibniz (see, e.g. Arthur 2006). For Highmore, 'spontaneous' generation is in fact not generation at all, but only the emergence of a previously subordinate seed from the decay of a dead living being. In some creatures, he believes, 'some diffus'd Atomes' shrink into the 'retired parts', and 'become as it were lost, in a wilderness of other confused seeds; and there sleep, till by a discerning corruption they are set at liberty, to execute their own functions' (Highmore 1651: 26–7). When animals die, 'from the walls of their bodies frequently, broken by corruption, issue forth other Creatures, differing in *specie* from (p. 274) themselves; as whosoever will but examine the production of *Insects*, shall easily finde' (Highmore 1651: 27). This is properly speaking not spontaneous generation but rather what may be called 'heterogenesis', in which one kind of creature dominates another kind as a part of itself, which part in turn rises to independence when its host begins to corrupt. Corruption of the one is generation of the other, and generation is, as Leibniz would put it, in fact only entrance into 'the larger theatre' (Leibniz 1849–1860, 6: 601).

## 11.4 Epicurus in England

As already mentioned in passing, one crucially important source of seventeenth-century natural philosophy, and not just in Britain, was the Epicurean tradition. Its revival was triggered by the rediscovery of Titus Lucretius Carus' (ca. 99–55 BCE) Epicurean poem, *De rerum natura*, in 1417, which quickly became a touchstone for many Renaissance debates about the nature of the Creation, the source of motion in nature, and of course about generation.

Lucretius had argued (or, perhaps better, announced) that everything arises naturally, without any need for separate supernatural creations for each individual creature, but that nonetheless generation is not simply a matter of the 'clumping' of

atoms. Rather, new creatures come forth from seeds: even if one of Lucretius' central principles is that nothing comes from nothing, at the same time 'Everything can't just spring from anything;/Inner capacities make things what they are' (Lucretius 1995: 173–4). It is these capacities that ensure the regular birth of infants to their conspecific adult parents: 'But if they could come from nothing, at once they'd spring/Up out of season, gestations all haphazard,/For there would be no atoms to be blocked/From a birth-giving union at bad times' (Lucretius 1995: 180–4).

Walter Charleton (1620–1707) is widely hailed as the most important conduit for the introduction of Epicurean ideas into England, though indeed there were others before him. (The first English Epicurean work of the seventeenth century was evidently Nicholas Hill's *Philosophia Epicurea* of 1601.) Charleton's particular version of Epicureanism, as captured in the title of his major work *Physiologia Epicuro-Gassendo-Charltoniana* of 1654, also involved a transmission, indeed a paraphrase, of the system of the French philosopher Pierre Gassendi. But like most of his English contemporaries, Charleton was also highly eclectic, and it would be a mistake to see his work as significant only in view of its transmitting role, notwithstanding his own hyphenated description of his physiological theory.

Charleton rejects Aristotelian generation theory, which 'supposeth a Threefold substance, the *Matter*, *Form*, and *Compositum* arising from the Commistion'. He (p. 275) rejects equally the theory according to which generation consists in 'the Accession of a Form to Matter', while the form involved is not substantial, but 'onely a certain *Accident* or Modification of the Matter it self: so that according to their theory, in Generation there superveneth upon Matter some certain Quality'. In the 'Catalogue of Philosophers of this persuasion', Charleton mentions Aristotle's own list of 'Principalls', which includes Empedocles, Anaxagoras, Democritus, and Leucippus, 'all which He sharply taxeth of Confounding Generation with Alteration', and of inferring that 'Generation [as well] as Corruption ariseth, not from the *Transmutation* of Principles, but onely from their ... *Concretion* and *Secretion*' (Charleton 1654: 417). Charleton thinks that Aristotle and the Stoics, in contrast 'vehemently contend' for the total '*Concorporation*' or 'Unition *per minimas partes*' of 'the Common Principles in Generation', while the atomists strongly assert 'that no Mistion of Elements, or Temperation of Principles, goes further than a meer *Apposition*, or *superficiall Contingency* of their several particles, so that the particles of each ingredient must still retain the very same nature they had before commistion, howbeit they may seem to be totally Concorporated, or Confused' (Charleton 1654: 419).

Yet Charleton denounces '[t]hese two so highly repugnant Opinions' (Charleton 1654: 419), the Aristotelian and Stoic on the one hand, and the atomist on the other, with equal disdain. His principal complaint against Aristotle is that for him, as his 'sectators unanimously tell us', the form is contained in the matter, 'not in *Act*, but onely in *Power*, or *Capacity*' (Charleton 1654: 423). But, Charleton asks, 'if it were not Actually contained in the Matter, how could it be Actually educed from thence?' To say that it is 'educed out of the Matter onely by the Power of the Agent' is for him 'a shamefull Desertion of the Quaestion', which is not about the power of the agent, but rather concerns how the form of a thing, 'which themselves assure to be a substance, i.e. a reall and self-subsisting Entity, and so clearly Distinct from the Matter of the Mistum, can yet be Educud out of that very Matter?' (Charleton 1654: 423). In order for the Aristotelian theory to be coherent, Charleton thinks, its supporters would have to assent to the existence of 'a certain portion of the Matter, and as it were the Flower, or purer part thereof, which should afterward, in Generation, be attenuated, refined, sequestred from the grosser mass, and then be again conjoynd to the same, and as it were Animate it' (Charleton 1654: 423). Charleton's invocation of the *flos materiae* here is a clear signal of his Gassendian, and also his chemical, heritage.

While the *Physiologia* inscribed Charleton within a prior continental tradition, other works, such as the *Natural History of Nutrition, Life, and Motion* of 1659, show Charleton at his most original. A key idea developed in this text is that nutrition and generation are 'one and the same Act of the soul or Formative virtue' (Charleton 1659: 1), and thus that the same natural philosophical and metaphysical questions may be illuminated through the physiological study of the one as of the other. Charleton continues:

(p. 276) The Platonist, though He holds the Deity, and the world to be co-eternal, doth yet allow the World to have been created by God: and to solve the seeming contradiction, saith, that *Priority* was not [*kata chronon*] in

respect of *time*, but [*kata physin*] in respect of *Nature*; as the Sun and light are coaevous, though the one be the Cause, the other the Effect. This, certainly, might be more justly said of the *Generative & Nutritive* Faculties ... by one of which an Animal is *produced*, and by the other *conserved*. For, though the *Formative* Virtue may seem to precede in its operation; yet are the *Stamina*, or rudiments of the Embryo scarce delineated, or adumbrated, when the *Nutritive* begins to augment and perfect them: So as that it may rather be said to go hand in hand with the Plastic's faculty, than to follow after it. (Charleton 1659: 1)

Generation and nutrition are, then, one and the same process, considered under different aspects. Charleton believes that nutrition, as a sort of continuous generation, is necessary to the living body because of the constant decay or 'depredation' of its parts. The efficient cause of the depredation of the parts, Charleton maintains, is 'the Vital Flame' (Charleton 1659: 2), and to the extent that it must burn for as long as we live it follows for him that 'we have one and the same Cause both of our Life, and of our Death; or (to speak more properly) our Life is nothing but a continuall Death, and we live because we dye' (Charleton 1659: 5). Life and nutrition are thus one and the same thing, and indeed nutrition is a precondition of eventual human ensoulment, 'for, the Embryo is nourished, before the *Empsychosis*' (Charleton 1659: 8).

For Charleton, in this work, there is not some pre-existing primordium of a being that begins at some point to be nourished; rather, the original generation occurs from the very same fluids that will then, in turn, nourish the being generated. Digby expresses a similar view of the relationship between generation and nutrition in his *Two Treatises*. There he writes: '[B]y the course of nature, and by passing successively many degrees of temper, and by receiving a totall change in every one of them; att the length an animal is made of such juice as afterwarde serveth to nourish him' (Digby 1644: 216). Charleton, for his part, explains at great length that the 'Material, or Constitutive principle' of a being is 'a certain sweet, mild and balsamical Liquor, analogous to the white of an egge, out of which the chicken is formed' (Charleton 1659: 9). Charleton maintains that 'all Animals are nourished with the same, out of which they were first fabricated', and supposes that 'we may well conclude, that the *Succus Nutritius* is in all qualities respondent to the Colliquamentum of the white of an Egge' (Charleton 1659: 9). In this connection Charleton also explicitly rejects the pangenetic theory in favour of an account of the generation of the creature out of a homogeneous fluid in terms that seem fully compatible with Harveian epigenesis: 'Nor are they in the right', Charleton declares,

who thinke, that the parts of the body being diverse, those of the Aliment ought also to be equally diverse. As if Nutrition were nothing else but a selection and attraction of fit aliment (p. 277) and that there were not required in every part a concoction, assimilation, apposition, and transmutation. (Charleton 1659: 9)

Here the Epicurean orientation of the *Physiologia* seems to have fallen by the wayside, to be replaced by a theory of generation that solidly rejects the atomist view that generation can occur through a mere rearrangement of parts, and that also seems to reject the modified Epicurean-cum-chemical view that any such rearrangement of parts capable of resulting in true generation will need to start from some primary concretion or primordium. Instead, generation occurs from a suitable fluid that is homogeneous, and once the generation occurs this same fluid serves as nutrition to the newly generated being, that is, serves as the source of its perpetual regeneration.

## 11.5 Robert Boyle

As John Henry and others have emphasized, British philosophy of the seventeenth century tends to be more concerned with the establishment of particular matters of fact through observation than with explanation by appeal to a priori principles (see Henry 2002). In this respect, Boyle's own philosophy is strongly aligned with the core principles of British experimental philosophy. From the 1650s on, Boyle remains firmly committed to the mechanical philosophy over its various alternatives, but there is clear reason to think that mechanism was for him the best working hypothesis to bring to a given experiment.

It would be impossible to offer even a remotely adequate treatment of Boyle's rich body of work here, and we will have to

content ourselves with merely sketching out a few of his views that touch upon our core interests in this chapter. Boyle is often held up as a mechanist par excellence, and indeed appears to have given currency to the phrase ‘mechanical philosophy’. Like a good mechanist, Boyle is committed above all, as he writes in *The Origine of Formes and Qualities*, to those ‘most Catholick Principles of Bodies, Matter, and Motion’ (B 5: 307).

Boyle’s *Forms and Qualities* of 1666–1667 is a particularly intriguing work, since it appears to supplement a very pure expression of ‘the mechanical philosophy’ with a subtle but recognizable invocation of Helmontian principles. He begins the treatise by appeal to the ‘Catholick or Universal Matter common to all Bodies, by which I mean a Substance extended, divisible and impenetrable’, and adds to this basic ingredient of the world that other basic principle of mechanical nature, namely, motion, ‘since we see not, how there could be any change in Matter, if all its (actual or designable) parts were perpetually at rest among themselves’ (B 5: 305–6). But Boyle quickly goes on to add what that other great mechanical (p. 278) philosopher, René Descartes, could never admit: that no description of matter in motion will ever be able to account for the generation of living things and for the transmission of species membership from one generation to the next:

I think also further, that the wise Author of Things did by establishing the laws of Motion among Bodies, and by guiding the first Motions of the small parts of Matter, bring them to convene after the manner requisite to compose the World, and especially did contrive those curious and elaborate Engines, the bodies of living Creatures, endowing most of them with a power of propagating their Species. (B 5: 306)

While Boyle rejects the material aspect of van Helmont’s pair of principles—namely, water and earth—he remains firmly committed to the Helmontian doctrine of *semina*. Thus for example he writes in an undated manuscript which has been fruitfully analysed by Clericuzio:

I must admire the strange power of the formative power of the seeds of things, which do not only fashion the obsequious matter according to the exigency of their own natures, and the parts they are to act; but doe also dispose an change the matter, they subdue, as to give it a consistency, which it seemed incapable of admitting. (Cited in Clericuzio 2000: 115)

But how exactly does Boyle imagine these seeds? As Anstey 2002 has highlighted, the corpuscles responsible for the reproduction of animate substances, and perhaps for the development of minerals and metals, are what Boyle sometimes, as in the *Sceptical Chymist* of 1661, calls ‘primary concretions’. These are highly resistant clusters of particles that are endowed with a texture able to give rise to the highly diverse forms of things in nature. Anstey argues that this doctrine can be traced back to Lucretius, but that in fact its origins also lie in Anaxagoras’ seed doctrine. However, Anstey emphasizes, ‘in modern terms they are effectively “theoretical entities” for which the only evidence is the recurrence of the form within nature that they are called upon to explain’ (Anstey 2000: 48; see also Anstey 2002 for a more thorough treatment of the same topic).

As we saw already in the case of Bacon, ‘texture’ is a notion that enables thinkers outwardly committed to the explanation of all natural generation and change in terms of arrangements of particles to nonetheless hold onto a sort of change that is for all practical purposes non-quantitative, since at the very subtlest levels at which we may speak of texture as contrasted with ‘figure’ or ‘shape’, the very existence of the quantitatively explicable arrangements of particles is a mere stipulation, back to which the qualitative diversity of visible nature is supposedly to be traced, even if we are incapable of doing the tracing ourselves. Boyle explains in *The Sceptical Chymist* that it is possible that

of these minute Particles divers of the smallest and neighbouring ones were here and there associated into minute Masses or Clusters, and did by their Coalitions constitute great store of such little primary Concretions or Masses, as were not easily dissippable into such Particles as compos’d them. (B 2: 230)

(p. 279) Generation or corruption takes place, for Boyle, whenever the texture of the primary concretions changes in a fundamental (but unobservable and indescribable) way. According to William R. Newman, Boyle’s introduction of primary



concretions—a notion quite absent from earlier texts such as the *Atomicall Philosophy* of the mid-1650s—signals an acceptance of a doctrine of *minima* or *prima naturalia*, on which ‘the smallest existing corpuscles, combine to form moleculelike aggregates of a semipermanent nature’ (Newman 2006: 172). Newman sees this new feature of Boyle’s thought as connecting him to the Bratislavan chemist of the early seventeenth century, Daniel Sennert.

There are, in sum, traces of chemical theories of generation and form in Boyle, but it is difficult to pin any of these on him definitively, mostly because Boyle himself is resolutely un-doctrinaire, to the point that some of his contemporaries, such as Leibniz, became deeply frustrated with him. It is clear, however, that Boyle prefers theories with explanatory force, and that if some of these come from the Helmontian or Paracelsian tradition, this is not because the English chemist has a secret penchant for obscurantism, but because there was already in the chemical tradition, as Newman and other scholars have persuasively argued, a deep-seated penchant for corpuscularian explanation of natural change.

## 11.6 Undying Ferments

Another thinker who, like Digby and Highmore, consciously positions himself in relation to the prominent ancient theories of generation is Thomas Willis (1621–1675), particularly in his *Medical-philosophical Discourse of Fermentation* published posthumously in 1681. According to Willis, there are in fact not two but three variant traditions ‘Concerning the beginnings of Natural things’ (Willis 1681: 2). There is, first, the familiar theory that all things are constituted out of earth, air, fire, and water, ‘and that out of the divers transpositions of these, Generation and Corruption, as also the changes of all alterations whatsoever, do arise’. Next is ‘the Opinion of *Democritus* and *Epicurus*, which lately also hath been revived in our Age’. This affirms that all natural effects ‘depend upon the Conflux of Atoms diversly figured, so that in all Bodies, there be Particles Round, Sharp, Foursquare, Cylindrical’, and even ‘Chequer’d or Streaked’ (Willis 1681: 2). These two positions, the Aristotelian and the atomist, are well known, but to them Willis explicitly contrasts a third opinion of the origination of natural things, one that ‘is introduced by Chymistry’. According to this view, ‘by an Analysis made by Fire’ all bodies are resolved ‘into Particles of Spirit, Sulphur, Salt, Water, and Earth’. This view ‘affirms by the best right, that the same do consist of these’. Willis concludes (p. 280) that because ‘this Hypothesis determinates Bodies into sensible parts, and cutts open things as it were to the life, it pleases us before the rest’ (Willis 1681: 2).

Traditional atomism is, in the end, preferable to ‘the Vulgar Philosophy, where Natural things are unfolded, with the vain figments of Forms and Qualities’ (Willis 1681: 1). Yet because chemical philosophy gives the most plausible account of the way in which sensible qualities of bodies may be traced back to basic elements, this is to be preferred above all. Willis notes that that central concept of chemistry, fermentation, is one that the ‘vulgar philosophy’ almost never addresses, while ‘among the more sound (especially of later years) who respect the Matter and Motion chiefly in Bodies, nothing is almost more usual But Fermentation hath its name from Fervescency, as Ferment from Ferviment or growing hot. The word is well known in making of Bread, and in the purgings of new Wine, Beer, and other potable Liquors’. In general ‘it is also applied to ... things, which are wont to swell or grow turgid, after the same manner’ (Willis 1681: 1). Famously, Descartes had invoked fermentation to account for the development of the foetus, as a process analogous to the preparation of beer, in which the seminal matters of each of the parents ‘serve as yeast the one to the other’ (AT XI: 254). Now Descartes has often been accused of hand-waving rather than explaining (not least, as we have seen, by John Ray), but the endurance of the explanation of generation as a sort of fermentation, from Descartes back to Jean Fernel in the mid-sixteenth century, and forward to Willis towards the end of the seventeenth, suggests that many conceived of this as more than a powerful metaphor, but indeed as a fundamental process that cuts across a wide variety of natural phenomena.

Unlike Descartes, however, who insisted adamantly that what he calls ‘spirits’ are in fact just a particular kind of body (AT XI: 334), no more like *res cogitans* than is a brick, Willis takes up the conception of spirits more akin to the Helmontian theory of corporeal *pneuma*. ‘Spirits’, Willis maintains, ‘are Substances highly subtil, and Aethereal Particles of a more Divine Breathing, which our Parent Nature hath hid in this Sublunary World, as it were the Instruments of Life and Soul, of Motion and Sense, of every thing’ (Willis 1681: 3). Thus they are the principles of life and of generation, and they are

variously unfolded when the right circumstances for their development obtain. They are the principles of generation, but also the principles of animation of generated, living bodies: restrained within 'the Vessels or Bowel of living Creatures', Willis writes, 'they are compelled more often to repeat the same measures of their motions for the performing the works of Life, Sense and Motion' (Willis 1681: 3). It is their action, rather than some mysterious 'forms' or 'qualities' in the vulgar sense, that 'determinate[s] the Form and Figure of every thing, prefixed as it were by Divine designation' (Willis 1681: 3).

Willis' theory is characteristic of a position taken up by many English natural philosophers of the late seventeenth century, who maintain that bodies are animated by a vital principle, but that this vital principle is in turn something that, very much unlike Descartes' *res extensa*, also shares some properties with the (p. 281) corporeal world. Some English natural philosophers would in turn adopt a pan-animistic view according to which all matter per se has some intrinsic capacity for sensation and motion, and thus is, in some sense, alive. Francis Glisson (1597–1677), for example, argues in his *Tractatus de natura substantiae energetica* (*Treatise on the energetic nature of substance*) of 1672 that there is an 'energetic nature' at work in all bodies. As Tobias Cheung explains, 'energetic nature is the "vital principle" of living, corruptible bodies, and at the same time it is the immanent principle of the differentiation of unitary substance' (2008: 135). Glisson's metaphysics is monistic, while nonetheless making room for a wide variety in nature, and, crucially, a distinction between living and non-living. For Glisson, as Guido Giglioni maintains, 'distinctions and differences are the result of a development internal to the nature of substance. Substance itself is a tendency towards growing distinctions and individuality' (Giglioni 2002: 33).

While there is certainly no room to chart the legacy of this sort of view after the period in question, it is at least worth noting that Glisson's thought, like that of other late-seventeenth-century English pan-animists such as Matthew Hale, who posits a *vis activa* in all matter, anticipates in important ways the vitalistic materialism of eighteenth-century French thinkers such as Julien Offray de la Mettrie and Paul-Joseph Barthez. One English thinker who was incredibly influential in the French Enlightenment is John Locke (1632–1704). Locke's definition of 'generation' has just the stipulative character one might expect of a thinker who is also careful to characterize entities only in terms of their nominal essences, or in terms of what we perceive of them. Locke explains that when a thing is

made up of Particles, which did all of them before exist, but that very thing, so constituted of pre-existing Particles, which considered altogether make up such a Collection of simple *Ideas*, had not any *Existence* before, as this Man, this Egg, Rose, or Cherry, *etc.* And this, when referred to a Substance, produced in the ordinary course of Nature, by an internal Principle, but set on work by, and received from some external Agent, or Cause, and working by insensible ways, which we perceive not, we call *Generation*. (*Essay* II. xxvi. 2)

Here Locke distinguishes generation from 'making', yet he gives no indication of how the new substance comes into being as a result of a process distinct from '*juxta* Position of discernible Parts' (*Essay* II. xxvi. 2), other than to say that whatever happens to lead to generation, it is not discernible.

Locke also distinguishes generation from alteration, which is simply the production of any new simple idea that was not previously in the subject. So the difference between generation and alteration maps onto that between substances and their properties. But what then is a substance in general for Locke? One characterization he gives of it says that it is nothing other than 'the unknown support of those Qualities, we find existing, which we cannot imagine subsist ... without something to support them' (*Essay* II. xxiii. 2). Of course, Locke does distinguish between substance in general, on the one hand, which is the bare (p. 282) substratum in which properties inhere, and particular sorts of substance on the other, such as trees and men. In the long citation above he is referring to particular sorts of substances, while the characterization of substance as 'the unknown support' concerns substance in general or the substratum. It is with respect to the understanding of substance as individual substance that, in the end, the distinction between generation and alteration rests on a distinction that may, for all Locke is willing to concede in the *Essay*, be merely conventional. In the same work, Locke also explicitly identifies the continuation of the life of a generated being, such as a man, as consisting simply in the 'succession' of 'constantly fleeting Particles' that are 'vitaly united to the same organized Body' (*Essay* II. xxvii. 6).



In the terms spelled out by Willis above in his three-part division of schools of thought, then, Locke would seem to be squarely in the camp of the traditional atomists. Yet we now know that Helmontian iatrochemistry, as well as a theory of generation based on seminal principles, played an important role in the development of Locke's thought. This should not be surprising: Locke studied medicine and chemistry at Oxford in the 1660s, where he could not but have been exposed to, and at least partially influenced by, this important new current of thought. If this influence does not come through as vividly as one might expect in the *Essay* of 1690, this may be because this work is more narrowly focused upon epistemological questions, but may also be because we have in the intervening centuries lost our ability to detect what would have been in the era clear allusions to the chemical tradition.

## 11.7 Conclusion

As we have begun to see in this chapter, 'the Chymists' were consistently presented as a challenging third party, alongside Aristotelianism and traditional atomism, in the effort to account for the composition of natural bodies. Particularly with respect to the question of the generation of these bodies, even figures who did not embrace chemistry, such as Descartes, nonetheless took recourse to chemical phenomena to explain generation. This may be because the riddle of generation was the single greatest obstacle to any mature programme of mechanical philosophy: so long as one wished to hold onto the view that there are some beings in nature that are more than simple rearrangements of parts—and this is a view that everyone, including Descartes, held to at least for human beings, and that most others held to for plants and animals—then one is obligated to take an interest in theories, such as the theory of seminal principles in its Helmontian version, that give some kind of account of the generated being without reducing it to a mere 'juxtaposition' of parts by external forces.

(p. 283) While this was a problem that natural philosophers were simultaneously facing throughout Europe, England was perhaps the most fertile ground for the cultivation of creative responses to the problem, if not responses that would be pleasing to more than their authors (if even that) for the long term. This creativity in addressing the problem of the origins of the qualitative diversity of beings in nature, and of how they arise, may stem, in part, from the unique combination in England of eclecticism—in which doctrines were built up through picking and choosing from available traditions, and just as soon rejected when they did not serve the theorists' purposes—together with a deep suspicion of excessive reliance on a priori principles, which compelled thinkers to get out and observe for themselves those qualitative differences, which are great indeed, for which natural philosophy aimed to provide an account.

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## Soul and Body\*

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## Abstract and Keywords

This chapter examines the views of seventeenth-century British philosophers on the theories of body and soul. It analyzes the relevant works of David Hume, John Locke, and Thomas Hobbes concerning pneumatology, suggesting that it was only the views of Locke and Hobbes that remained part of philosophy's explicit self-image and featured in standard general histories.

Keywords: body and soul, British philosophers, David Hume, John Locke, Thomas Hobbes, pneumatology, spirits, Aristotelian traditions

IDEAS about soul and body—about thinking or remembering, mind and life, brain and self—remain both diverse and controversial in our neurocentric age. The history of these ideas is significant both in its own right and to aid our understanding of the complex sources and nature of our concepts of mind, cognition, and psychology, which are all terms with puzzling, difficult histories. These topics are not the domain of specialists alone, and studies of emotion, perception, or reasoning have never been isolated theoretical endeavours. As Francis Bacon described human philosophy or ‘the knowledge of ourselves’, within which he located the study of body, soul, and mind, it ‘deserveth the more accurate handling, by howe much it toucheth us more neerly’ (OFB 4: 93). The history of ideas in these domains is particularly challenging given the practical dimensions and implications of theories of mind. Because theories of human nature and debates about body and mind do ‘touch us’ so ‘nearly’, they attract and can thus reveal, in specific historical contexts, interconnected discourses or associations which may be quite unlike our own. So there are no neat boundaries around a historical category of ‘seventeenth-century British philosophy of the soul’. The central topic of this chapter can be thought of either as *pneumatology*, the doctrine or science of spirits and souls, or as continuous with the ‘psychologia’ or *psychology* of Aristotelian traditions (Park and Kessler 1988; Hatfield 1995: 184–6). In neither case, however, (p. 286) should we expect any deep unity to be provided by history, geography, discipline, or subject matter.

Bacon divided that part of human knowledge ‘which concerns the mind’ into two parts; one ‘that enquireth of THE SUBSTANCE OR NATURE OF THE SOULE OR MIND; The other, that enquireth of the FACULTIES OR FUNCTIONS THEREOF’ (OFB 4: 103). In developing their views about soul and souls, the seventeenth-century writers we examine here, whether insiders or outsiders to the natural philosophical mainstream, sought integrated approaches to metaphysical, psychological, and ethical issues. On these topics philosophers were always in close dialogue with other studies, of which the most important were theology and medicine, while throughout the century ideas about body, soul, and self were also powerfully articulated in literature (West 1969; Dollimore 1984; Fox 1988; Scarry 1988; Paster 1993, 2004; Sawday 1995; Harris 1998; Rousseau 2004, 2008). Debate about the soul was one of the most controversial of all topics in seventeenth-century philosophy because of its religious, moral, and political implications. Although there was no sealed arena

of scholarly dispute isolated from 'external' social and cultural influences, relations between psychology and politics were never determining (in either direction): one view about the soul could in different contexts be put to use in distinct ethical or religious frameworks, and similar ideological ends served on different occasions by quite different metaphysical accounts of our nature.

With regard to geography, Robert Frank's judgement that British medicine in 1600 suffered from both 'linguistic insularity and ... dependent status' (1997: 69) applies equally to the British pneumatology of that period. As with medical theory, by 1700 accounts of the soul in British philosophy were more tightly integrated into European discussions: but in this chapter we do not deal with questions of British influence by and on the major continental theories of body and soul, which are far from well understood, nor directly with the relations between British political history and theories of body and soul (Schaffer 1987; Marshall 2000). Even by the end of the period, certain topics and approaches might have contingent local significance: Hume, depressed by his own failure to catch his 'self', reflected within fifty years of John Locke's *Essay concerning Human Understanding* that personal identity 'has become so great a question in philosophy, especially of late years in England, where all the abstruser sciences are study'd with a peculiar ardour and application' (Hume 2007 [1739]: 1, 169; compare Tomaselli 1984). Locke and Thomas Hobbes are the only British writers on soul and mind in this period whose views remain part of philosophy's explicit self-image and feature in standard general histories: their work is discussed fully in other chapters, and so here we focus primarily on a range of minor characters within these contested fields of natural philosophy.

The proper usage of key terms such as 'soul', 'spirit', and 'mind' was always under negotiation, and cannot be established neutrally. The concept of soul operated in at least two distinctive contexts, centring on immortality in Christian eschatology, (p. 287) and on our animating life functions in natural philosophy. Neither of these senses closely matches a modern notion of 'mind' at all. There are diverging opinions about how explicitly philosophers before the seventeenth century had identified tensions between these distinct senses of 'soul', but various systems of medieval and renaissance philosophers offered more or less integrated understandings of how life functions relate to human intellectual or rational capacities (Matson 1966; Des Chene 2000; King 2007; Pasnau 2007). While some seventeenth-century philosophers sought to halt or bypass this problematic, in some cases by foregrounding 'mind' as a preferred alternative, the majority continued to work within its bounds. Uses of 'spirit' were even more diverse: while sometimes 'spirit' might refer to the immortal soul, the term was also often applied (in both popular and scholarly usage) to a range of intermediaries in body, world, and cosmos, subtle fluids or finer substances which were neither grossly material nor purely incorporeal (Walker 1985; Sutton 1998: 25–49).

Detailed semantic histories of our concepts of mind or soul, attention or consciousness, employing the methods of comparative and cognitive linguistics, have been surprisingly rare (but see Wilkes 1984, 1988; Wierzbicka 1992; P.S. Macdonald 2003). Philosophers' historical work on these topics has instead focused on the legacy of Descartes, in the wake of the tragic histories offered by Gilbert Ryle and Richard Rorty, by which Descartes is said to have invented a mythical, reified 'mind' populated by static 'ideas' which might or might not reflect or represent reality, in 'the original sin of epistemology' (Rorty 1980: 60, n32; compare Putnam 1994). Such large-scale accounts float rather free of the details of seventeenth-century British philosophy, rushing straight from Descartes to 'British empiricism' in a familiar but misleading grand narrative (Norton 1981). Theory-driven claims to identify dramatic epistemological ruptures in the seventeenth century would arguably be more convincing if they were also anchored in the messy, ongoing fray of the local natural philosophical field and its neighbours (Schuster 1990). In particular, suggestions that the modern mind–body problem was in some sense new need to be tested not only against debates in ancient and other cultures, but also against the full range of early modern discussions. It is possible to write a coherent account of some recognizable 'mind–body problems' in the seventeenth century (Garber and Wilson 1998): but, in general, the disputants themselves saw concerns about union or interaction as integrated among a much broader set of topics. As well as integrating with accounts of the passions (see Chapter 19 in this *Handbook*), a fuller history would address not only the varieties of dualism, but also issues about perception and vision (MacIntosh 1983; Yolton 1984a; Meyering 1989; Hatfield 1990; Clark 2007), common sense (Harvey 1975; Heller-Roazen 2007), gesture (Roach 1993; Wollock 2002; Smith 2010), madness and psychological healing (M. Macdonald 1981), and dreaming and imagination as well as memory and perception. It would also trace the history of intelligent cognitive practices

—navigation, experimentation, remembering, reading, and so (p. 288) on, as well as the array of complex and flexible activities of religion, craft, and leisure (Johns 1998; Tribble 2005; Sutton 2007; Smail 2008; Tribble and Keene 2011). This chapter retains a focus, however, on the history of *theories* of mind: we address an array of distinctive positions in metaphysics and psychology which emerged in wider British debate, each with potential religious, moral, and political implications. We proceed by selectively surveying the conceptual inheritance and challenges for British philosophers in the early seventeenth century with regard to both the soul and the humoral temperament of body and mind. We look at some of the eclectic systems developed by British philosophers of the soul in the mid-century period, and at different ways new ideas in both medicine and metaphysics were integrated.

## 12.1 Body, Soul, and Humoral Psychology

Although they saw metaphysics, morals, and medicine as closely linked, early seventeenth-century writers on body and soul could draw on distinctive strands within the fabric of inherited belief across these domains, depending on their commitments and aims. For many purposes, potential points of tension—notably between Christian belief and certain doctrines derived from Aristotle or Galen—were naturally downplayed, even when in other contexts they might spark severe conflict. So, as we vary the grain of historical analysis on ideas about body and soul around 1600, we can find evidence for either a more-or-less unified ‘Elizabethan psychology’ (Anderson 1927), or a more uneasy, crisis-ridden transition (Dollimore 1984; Sawday 1995).

The medieval Christian system from which this inheritance derived was not pervasively dualist: the resurrection of the *body* was the focus of eschatological hope, and more gradualist pictures of human nature assumed a triadic system of bodies, spirits, and souls, or postulated a continuum rather than a sharp line between gross matter and pure incorporeal substance (Bynum 1995a, 1995b). But Aquinas and other philosophers did seek to align Aristotle’s account of soul as the form or first actuality of the body with a commitment to personal immortality. The human soul had a threefold nature, or three sets of faculties. In its vegetative faculties, the soul shares its nutritive and reproductive principles with plants and other animals; in its sensitive and self-moving faculties, the soul shares its capacities for perception, movement, memory, and so on with other animals; while in its intellective faculties, the human soul reveals unique capacities to exercise will and reason (Harvey 1975; Kessler 1988; Park 1988). Although for embodied creatures in this life knowledge arises from the senses, the active human intellect can also (p. 289) abstract away from corporeal objects of knowledge, ultimately coming to know immaterial objects, and to reflect on its own nature (Hatfield 1998; Kessler 1988; McCracken 1998).

Despite a range of internal disputes, and the rediscovery of Platonic doctrines which tended to threaten the integration of the organic faculties within a coherent vision of human nature, this broadly consistent picture which encompassed life and cognition or reasoning together in a single system retained its hold. This was so even in the wake of more severe internal crises in the early sixteenth century, when Pope Leo X’s Lateran Council in 1513 requested philosophers to apply themselves to demonstrating the immortality of the soul by natural reason (rather than by faith alone), and to refuting such ‘extremely pernicious errors’ among dissident Aristotelians as that the soul ‘is mortal, or only one among all human beings’ (Michael 2000; Casini 2007). Both this decree and the brilliant mortalist criticisms of existing rational arguments for the separability of the soul which Pietro Pomponazzi published soon afterwards cast long shadows over subsequent debate (Kessler 1988; Michael and Michael 1989; Sutton 1991; Michael 2000; Gaukroger 2006; Casini 2007). In the wake of the Reformation, this stress on the rational proof of immortality was sometimes seen by British philosophers as dangerously Catholic, and as threatening faith by limiting the power of God to bestow immortality by grace alone (Henry 2010). But in the mid-seventeenth century, not only Descartes (CSM 2: 4) but also English philosophers like Walter Charleton (1652) appealed to the Lateran command that ‘all Christian Philosophers’ should ‘sharpen their Styles’ and dispel the ‘darkness of atheism’. By then, indeed, doctrines of the soul mattered in part because atheism was seen as a genuine threat. Both Catholic and Protestant reform movements focused attention more sharply on the nature and spiritual health of the soul as ‘the proper object of internal eschatological expectations, as well as external disciplinary pressures, that were of an unprecedented



intensity' (Gowland 2006a: 103). As a result, even though English heterodox and mortalist views of the soul throughout the seventeenth century were in general aimed at identifying the true religion rather than at atheist or secularizing ends, fears of real or imagined radicalism were moral and political in focus as much as metaphysical, and thus subject to more forceful policing (Schaffer 1987; Thomson 2008).

Yet both the scope and much of the detail of Aristotelian psychology continued to animate philosophies of the soul, even as alternatives began to be developed for particular components of the scheme. Below we discuss the ambitious synthesis of Aristotelianism, atomism, and mechanism offered by the eclectic Catholic philosopher Kenelm Digby in his *Two Treatises* (1644): but it is worth noting first that despite the unusual contents of Digby's first treatise, *Of Bodies*, it is structured in entirely typical fashion as a journey through the realms of Aristotelian natural philosophy. In terms of the book's overall design, driven by and towards the defence of incorporeality of the intellective soul in its second treatise, Digby claims *not* to be delivering 'an entire and complete body of natural philosophy', or (p. 290) meddling with 'the vast universe'. But in practice this is less of a general disclaimer of Aristotelian ambition than a specific apology for not including a full cosmology that would 'shew by what stringes and upon what pinnes and wheeles and hinges, the whole world moveth' (1644: 144). Digby's otherwise comprehensive treatment of matter theory gives rise from chapter 23 onwards to a description of how 'Plants and Animals ... are framed in common' and of growth, generation, and nutrition. After discussing sensation and the sensible qualities, treating the external senses in turn, Digby moves on to what Aristotelians called the internal senses, then to self-motion and the passions, pausing throughout to address long-standing controversies on, for example, colour and the nature of animal souls.

The explanatory agenda of seventeenth-century philosophies of the soul thus continued to span the entire range of phenomena between life functions and reason. Importantly, this was also the case for Descartes and his followers, despite their self-conscious elimination of the organic or vital functions of the soul. Rejecting the Aristotelian unity of the soul across its biological and intellectual capacities, Descartes argued that 'the principle by which we are nourished' is entirely distinct in kind from that by which we think (CSM 2: 246). Whether we see this new dualism between life and mind as the replacement of the soul by the rational mind, or (as Descartes preferred) the deliberate identification of soul with mind (Pasnau 2007), it still required a full (in this case entirely mechanical) treatment of both life functions (Des Chene 2001) and the sensitive powers (Sutton 2000). So the traditionally intimate links between European metaphysics, medicine, and natural philosophy (Schmitt 1985), to which we now turn, were retained even alongside new metaphysical schemes.

At varying levels of detail and sophistication, British philosophers continued to work within the fusion of Hippocratic, Galenic, and Aristotelian medical and physiological accounts of *psyche* (Siraisi 1990; Lindeman 1999: 8–17; Arikha 2007). This holds both for general works on the human body such as Helkiah Crooke's *Mikrokosmographia* (1615) and for more psychologically specific or idiosyncratic works like Thomas Wright's *The Passions of the Mind in General* (1686 [1604]) and Robert Burton's *The Anatomy of Melancholy* (first edition 1621). In Renaissance medicine, Galen's reworking of the Hippocratic theory of bodily humours and qualities was conjoined with the Aristotelian faculty psychology, providing a framework for understanding health, disease, and temperament which spanned cognitive, vital, and nutritive activity. Health was a proper blending in the mixture of the four humours, and a concomitant equilibrium in the balance of the four qualities. In many versions, the three faculties were localized in liver, heart, and brain, in which operated distinct forms of bodily spirits—natural, vital, and animal spirits respectively. Whether Galen's idea that the mortal part of the soul just *is* 'the mixture of the body' (1997: 153, 157) was accepted or not, moral physiologists and medical psychologists alike could draw especially on rich traditions of psychological explanation in terms of alterations in the animal spirits. These nervous (p. 291) fluids are the messengers in the perception-action cycle: 'like quicke Postes' or heralds (Crooke 1615: 824), they course differently through brain and nerves in exquisite response to changes in the humours and the blood, in the bodily organs, or in the passage of materials and spirits across the body's orifices (Sutton 1998: 31–49).

These animal spirits were among the 'naturals', body parts like blood, elements, and humours common to all. The 'six things non-natural' were influences on the balances of these fleeting internal fluids: air or climate, food and drink, sleep and wake, motion and rest, evacuation and repletion, and passions or perturbations of mind (Rather 1968). England's watery climate,

for example, was thought to give rise to moist complexions, unusually porous and thus vulnerable bodies, and the inconstant behaviour of its ‘variable and unsteady’ inhabitants (Floyd-Wilson 2003: 53–66; Sutton 2007). But this geo-humoralist psychophysiology was not a static, environmentally determinist system in which character was fixed into stable types (Bos 2009). The humoral body, or enmattered *psyche*, was dynamic: ‘individual complexions were impermanent, and the mixtures upon which they were based were constantly fluctuating’ (Gowland 2006b: 46; Paster 2004). Multi-causal accounts of psychological capacities such as memory, imagination, and the passions were a central part of this scheme. The non-naturals long continued to underpin individualized schemes of regimen, retaining a central role in both theory and therapeutic practice well beyond the seventeenth century (Temkin 1973: 181; Siraisi 1990: 97; Wear 1995: 360).

Burton grounds his extraordinary and influential compendium of ideas about melancholy in a coherent synthesis of existing accounts of spirits and of all three faculties of the soul (Babb 1951), located within a ‘Digression of Anatomy’ (1989 [1621]). As in many popular English writers, Burton’s medical psychology also underpinned an ethics of self-regulation which bridged health, thought, and conduct (Schoenfeldt 1999; Tilmouth 2005). English literary, political, and cultural fashions may have shifted more across the remainder of the seventeenth century than did the medico-psychological framework which animated Burton’s work. Those who employed this framework knew, however, that it was far from complete or consistent: as well as Burton’s tireless cataloguing of disputed points, Crooke appends an explicit and evaluative discussion of ‘controversies’ on every topic, asking for example ‘whether the Principall faculties have distinct places in the Braine’ (1615: 504).

These then are significantly holistic views of the relations between soul, body, and world, in which both natural and moral philosophy require understanding of the complex forms of continuous reciprocal causation by which the person interacts with the physical and social world. Even a self-conscious innovator like Francis Bacon, developing a distinctive method and style for natural philosophy, also employed ‘a deliberate overlapping of explanatory levels’ (Gigliani 2010: 160). This was based, in the speculative system he developed in *Sylva Sylvarum* (p. 292) (published posthumously in 1626), on Bacon’s literal attribution of conflicting structural appetites and motions (such as trepidation, resistance, and liberty) to matter (SEH 2). In natural philosophy as in moral and civil matters, Bacon saw knowledge as the mastery of ‘the appetites of matter’ (Gigliani 2010): in the case of ‘the cure of men’s minds’, philosophy can supplement divinity by helping us train our own habits just as, by industry and practice, tumblers or wrestlers alter their bodily capacities (OFB 4: 102–3, 151). We can come to understand the ways that inanimate spirits mix with vital spirits to drive the volatile physiology of the self (Rees 1996; Paster 1997; Gaukroger 2006: 166–220).

## 12.2 Kenelm Digby: Aristotelian Mechanical Philosophy

Early seventeenth-century atomistic natural philosophers in England such as Nicholas Hill, Thomas Harriot, and Walter Warner showed some interest in psychological topics. Hill, for example, describes a continuous trajectory in which emanations from objects affect the sense organs, giving rise to sensation, imagination, intellection, and subsequent memory, while Warner invokes animal spirits theory in a physiological psychology based on constant flux (Jacquot 1974). We know little more about the details of the natural philosophies discussed in the 1630s in the circles of Lucius Cary and Charles Cavendish. Although both Digby and Hobbes had links with these groups, their distinctive and novel syntheses of ideas about body and mind owed more to their networks and experiences in France, and to their interests in the new natural philosophies being developed by Descartes, Gassendi, and Mersenne. Where (as described elsewhere in this *Handbook*) Hobbes constructed a coherent materialist theory of mind, of a form unprecedented in the Christian era, in close union with a new political philosophy, Digby’s eclectic project was driven in part by the specific and entirely unsuccessful politico-religious aim of defending a reformed Catholicism acceptable to English Protestants (Henry 1982, 2010).

Despite the failure of his theological projects, the interventions in natural philosophy which Digby undertook along the way are of considerable interest: we see in his work an extraordinary integration of the new mechanical philosophy with the Aristotelian tradition. On mainstream modern accounts of the Scientific Revolution, such a synthesis should simply not have been possible. The assumption, promulgated in later seventeenth-century rhetoric, that genuinely new philosophy could only

emerge by way of the destruction of Aristotelianism, leads even the most sensitive critic to describe Digby's programme as 'a vertiginous cobbling (p. 293) together' of intrinsically incompatible ideas (B.R. Smith 2009: 116). Digby's intense, richly idiosyncratic natural philosophical prose is a far cry from the official sober style of the Royal Society ideals at a time when the nature of the mechanical philosophy was being forged (Hall 1999). In some contexts Digby does invoke the limitations of matter's capacities, so as to underline the necessity of immaterial principles to explain human understanding and volition (Garber 1998: 770–1). But this is a far cry from having already entrenched the idea that mechanism simply required a revolutionary conception of matter as entirely passive. The historiographical temptation to *identify* the mechanical philosophy with a commitment to passive matter has been shown to result from uncritical acceptance of certain rhetorical claims by Royal Society natural philosophers, and to disguise their invocation of a range of active principles in explanatory practice (Henry 1986a; Schaffer 1987). In Digby's *Two Treatises*, written in an earlier and different context, explanations of natural phenomena in terms of matter in motion coexist comfortably with Aristotelian forms, powers, and faculties.

From the mid-1630s, Digby had worked with the controversial Catholic philosopher Thomas White to defend a renewed theology, rejecting certain Catholic doctrines such as Purgatory, in conjunction with a reformed atomist interpretation of Aristotle which saw his natural philosophy resting on the combination or 'mingling of the least partes or atomes of the said Elements' (1644: 343; Krook 1993; Henry 2010). Digby read Descartes' *Discours de la méthode* when it came out in 1637, and visited Descartes in 1640: he gained a clear sense of Descartes' suppressed work of the early 1630s, especially the key physiological treatise *L'homme*. Digby thus came to couple atomistic explanation with the idea that not only nutrition and growth, but also motion, sensation, imagination, and memory could be accounted for in terms of corporeal interactions. Descartes' influence is also apparent in Digby's awareness that our sensory access to reality is partial and selective: 'of this great machine that environneth us, we, who are but a small parcell, are not immediately concern'd in every part'. But Digby also criticizes Descartes on a number of significant details. Digby retains an atomistic version of the Aristotelian idea that perception involves a transmission of forms: because 'there is a perpetual flux of little parts or atoms out of all sensible bodies', these 'exceeding little' bodies actually 'gett in at the dores of our bodies, and mingle themselves with the spirits that are in our nerves' (Digby 1644: 278). Where Descartes saw peripheral stimulation as instantaneously influencing the brain by way of the movement of the nerve as a whole, Digby has sensation as well as motion carried by these 'exceeding little' bodies by way of the animal spirits (the 'porters of all news'), until the information carried by the spirits, 'subtle messengers of the outward world', is judged at 'the tribunal of the brain'. Sceptical challenges are thus kept in check within Digby's theory of perception: there are mediating material transformations involved, but in this revised Aristotelianism little similitudes from the world itself partly drive the internal processes.

(p. 294) Digby reserves vehement criticism of Descartes' physiological psychology for the theory of memory, a topic of considerable moral and political significance in seventeenth-century England, in addition to its intrinsic importance within the natural philosophy of body and soul (Sutton 1998). Correctly interpreting Descartes as arguing that the vehicles of corporeal memory are 'determinate motions'—the patterned flows of animal spirits through the pores of the brain—Digby complains that it is impossible that 'such a multitude of pure motions, as the memory must be stored withall for the use and service of a man, can be kept on foote in his braine, without confusion; and for so long a time as his memory is able to extend unto'. The 'impressions upon the common sense' are no more likely to be 'actually conserved, alwayes actually moving in our head', than are melodies played on the lute (Digby 1644: 283). So, according to Digby, memories themselves must be bodies, rather than motions or patterns. Again, he invokes the material bodies which have been driven to the braine, from external objects themselves. After they have reached 'that part of the brain where knowledge resideth', they rebound to find 'some vacant cell, in which they keep their rankes and files, in great quiet and order', preserving their original order. The 'little similitudes' stay there, 'in the caves of the braine wheeling and swimming about', until roused by chance, by appetite or fancy, or by the will. When we want to remember a sequence of events, they are again raised up and 'then they slide successively, through the phantasie'. Referring to Galileo's teachings on the proper motions of undisturbed bodies, Digby describes the aftermath of remembering, when the bodies 'return gently to their quiett habitation in some other part of the braine', where they continue to float in a 'liquid medium'. Of course we do not always succeed in controlling this process, and Digby acknowledges that the fancy will sometimes retrieve the wrong object, or 'displeasedly' give up the search when 'growne

weary with tossing about the multitude of little inhabitants in its numerous empire' (Digby 1644: 286).

Like Bacon, Digby also engaged in ongoing attempts to understand the nature of imagination, which both philosophers thought to have a wider array of influences and effects than commonly supposed. Imagination operated by mechanical powers of sympathy, which could transmit determinate influences by way of the contact of contiguous atomic compounds even over a distance. Although some have suggested that this strand in Digby's work, especially as it appeared in his later works on the weapon-salve or powder of sympathy, and on plants, signifies a more Platonic turn, away from Aristotle (Janacek 2000), in fact these ideas are consistent with treatments of similar topics in the *Two Treatises*, and with Digby's overarching atomistic Aristotelianism. They do show Digby's willingness to accept and seek to explain what seemed to be 'occult' phenomena, those whose causes and nature were not manifest: but the explanations he seeks to develop remain, in intention at least, strictly mechanical, aiming to refer to nothing more than the motions and histories of corporeal bodies. Although Digby also speculated on palingenesis and spontaneous generation, and on the means by which God might engineer the (p. 295) resurrection of the human body, he did not see any suggestion that matter might have such unexpected powers as to threaten our rational confidence in the immortality of the soul.

In his second *Treatise*, Digby works through the central operations of the intellectual soul: apprehension and abstraction, thinking and knowing, discoursing, and voluntary action. He provides a numerous array of 'proofs' of incorporeality and thence immortality: though he borrows some lines of thought from Christian Aristotelianism, Digby's central vision of the soul is clearly influenced by Descartes (Henry 1982; Garber 1998; P.S. Macdonald forthcoming). The soul is not only, as in Descartes, entirely independent of the life functions: further, it is not extended, has no parts and, when severed from its 'benumbing compartner' the body, is subject to no local motion, translation, or change. The soul's fate is wholly fixed by our actions in this life, and then instantaneously attains its future state, 'invariably for all eternity', with no interval of either sleep or purgatory. When delivered into an eternity of bliss, the souls of the saved are outside time and happily forgetful. Such descriptions of the soul did not prompt Digby to address the concerns about the nature and means of its union with the body which Descartes discussed in his later works (Sutton 2000). Indeed, 'Digby never took the problems raised by dualism seriously' (Garber and Wilson 1998: 839), and in writing with supreme confidence about the state of the soul Digby's primary intention was to construct a rational religion which Protestants might embrace in the defence against materialism and atheism. Even when later seventeenth-century British philosophers offered similar views on the soul, they tended to disclaim the kind of reasoned certainty that Digby sought, preferring to ascribe their ultimate confidence in immortality to God's mysterious powers. So Boyle, for example, distanced himself from Digby by quoting Descartes with approval for writing to Princess Elisabeth that his own knowledge of 'the state of the soul after this life' was 'far inferior to that of Monsieur (he means Sir Kenelm) Digby' (B 8: 24).

## 12.3 Philosophies of Body and Soul in the Later Seventeenth Century

British philosophers in the middle years of the seventeenth century were if anything more eclectic in their approaches to mind, body, and soul than in other areas. Historians' wish to home in on a single, coherent theory of mind-body interaction in writers like Walter Charleton, Thomas Willis, Margaret Cavendish, Henry More, Robert Boyle, or indeed John Locke and Isaac Newton may be thwarted by the (p. 296) multiplicity of contexts (moral, medical, metaphysical, pedagogical, theological, and more) in which they wrote, and by the diverse aims of the distinctive projects in which any one philosopher might engage over an extended period. Different targets had to be refuted for different audiences. Materialist and mortalist threats appeared more dangerous on some occasions, on others resurgent Catholicism.

Emily Booth has convincingly argued that Walter Charleton, for example, did not intend to present a coherent atomistic mechanism across his various works on physiology and the soul, but deliberately avoided using a single doctrine. Where Charleton appears to entertain or even endorse incompatible theories of muscular motion, for example, or about the

existence and nature of animal spirits, this does not necessarily signal his own uncertainty, but rather a calculated 'commitment to eclectic method' as an authoritative and modest form of self-presentation, in which balanced syncretism and professional epistemological caution were to be valued more than innovation or progress (2005: 140, 216; compare Anstey 2000: 5–6 on Boyle's eclecticism). The fact that Charleton saw no need decisively to choose between Aristotelian faculty psychology and the new corpuscular framework suggests, as Booth puts it, 'the lack of any discrete theory-change' in these domains (2005: 104).

So in theories of body and mind, the 'Scientific Revolution' in British natural philosophy was not a thorough, sudden victory for passive mechanical conceptions of the body. Some historians have offered broad characterizations of British forms of dualism, especially after the Restoration, as pulling apart the autonomous, ruling soul from the barren bodily automaton. This interpretation is sometimes linked with a desire on the part of the natural philosophers of the Royal Society to enforce norms of hierarchical order in human nature as in the state, after the confusion of the Interregnum (Easlea 1980; Merchant 1980; Mayr 1986; Sawday 1995). Certainly the language of control, subordination, and dissent is pervasive in many later seventeenth-century works on the soul, and not only in discussions of the passions: ongoing controversies in medical psychology and the moral physiology of self were often negotiated in charged politico-theological settings (Iliffe 1995; Suzuki 1997; Hawkins 2002; Martensen 2004; Thomson 2008). But the accounts of body and soul in question were multifaceted, and resist neat mapping onto ideological agendas. In general matter theory many of these philosophers, on occasion at least, still invoked various properties and powers which do not fit with an austere mechanism of entirely passive material substance (Henry 1986a; Schaffer 1987; Dempsey 2006). As this applies to physiology, the line between strict mechanism and more 'chymical' approaches based on the fermentation of volatile bodily substances was far from firm (Clericuzio 1994). Thomas Willis, for example, developed views closer to Gassendi's chemical atomism than to Descartes' physiological psychology. Explicitly retaining the soul's traditional life functions, Willis (1672) accepted a corporeal or sensitive soul as well as the intellectual or rational soul. The sensitive soul governs both life and sensorimotor functions, and can (p. 297) either be governed by or in various relations of conflict with the rational soul (Wright 1991). Willis also argued that the complex and structured windings and turnings of the brain's solid parts, rather than the ventricles, were central in driving perception, imagination, memory, and some forms of inferential thought: such distinctive questions about the nature of the specific cerebral bases for cognitive functions became increasingly central in later seventeenth-century comparative anatomy and philosophy of neuroscience (Bynum 1973; Brown 1977; Brazier 1984; Zimmer 2004; J. Smith 2007).

What mattered to these experimental mechanical philosophers was thus not always the particular conception of body with which souls were to be related, but that limits should be firmly set to those powers, whatever they might be. Dualism did not have to take any one particular form. In his remarks on body and mind, Robert Boyle took a different tack (Anstey 2000: 187–204). God may operate, suggests Boyle, not merely through natural and supernatural operations, but also by way of 'a third sort': these are operations which are not mechanical, that is 'natural in a stricter sense', but 'supramechanical' or 'natural in a larger sense' (B 12: 477). Where ordinary interactions between bodies are the occasion of God's law-like intervention in the world, cases of mind–body interaction—as when a man through 'the arbitrary power of his will' raises a book with his arm—function under distinct and arbitrarily established laws instituted by God. Boyle suggests that the soul may guide or regulate the motion of some parts of the body, in particular that of animal spirits: he seems to have meant that it has the power to determine the direction of bodily motions (Anstey 2000: 193–7).

Only those who were seen as denying that intellect and will needed distinctive explanation were attacked for threatening this balanced space of orthodox dispute about soul and body. On the one hand, the materialist framework for understanding all psychological functions offered by Thomas Hobbes was widely vilified (Mintz 1962). Some of its most innovative features were thus neglected, such as Hobbes' treatment of the association or 'train of thoughts' or 'mental discourse' (1651), his account of reasoning as computation developed in *De Corpore* (1655), his neo-Stoic stress on 'conatus' or endeavour as a mechanism of self-government or motion outward in a continuous deterministic cosmos (Kassler 1991, 1995, 2000), and his vision of language's transformative effects on the scope and systematicity of human cognition (Pettit 2008). The extensive efforts which Hobbes made to provide a firm scriptural basis for his view that the soul was material and mortal were also repeatedly bypassed, as his opponents identified his views as commonly with atheism as with mortalist doctrines within the



Protestant church (Thomson 2008). On the other hand, more vitalistic philosophers who rendered matter spiritual by stressing more consistently its inherent activity, such as Francis Glisson (1672) and Anne Conway (1690), also ran the risk of collapsing intellective and rational powers into dangerously monistic systems. Glisson, for example, ascribed a pervasive active irritability to biological substance. Organic matter is ‘energetic’, (p. 298) with perceptive, appetitive, and self-motive qualities, such that it organizes itself into particular compound bodies and grounds from within the exercise of our sensitive and active functions. The nerves, for example, have through ‘custom and long practice’ attained some autonomy in producing motion (Henry 1987, 1989; Giglioli 2008). Despite their obvious differences, then, the philosophies of body and soul offered by Hobbes and Glisson were among the primary targets of criticism among the Cambridge Platonists, of whom the leading theorist of the soul was Henry More.

More was equally hostile to stricter mechanisms and more florid vitalisms. He had been one of the first English thinkers after Digby to fall under Descartes’ spell, telling the Frenchman in his first enthusiastic letter of 1648 that his predecessors in natural philosophy were only dwarves and pygmies in comparison (AT V: 237). But among a number of disagreements in their brief correspondence, More had already outlined a very non-Cartesian vision of matter, claiming that ‘everything which is called body is alive with a stupid and drunken life’ (AT V: 383, criticized by Descartes AT V: 405, CSMK: 382). Gradually More developed a rich alternative metaphysics which invoked a ‘spirit of nature’, or plastic power which is essentially for the animation of matter (Gabbey 1982, 1990, 1992; Henry 1986b, 1987). Considered merely in their mechanical operations, bodies are entirely incapable of complex or sensitive operations, and More constantly poured scorn on those who ‘are so sunk into the dull sense of their Bodies’ as to deny the incorporeal realm, who reduce all change to ‘the result of an Eternal Scuffle of coordinate Causes, bearing up as well as they can’ (1662 I: 9. 2). The brain, being just a ‘loose Pulp’ of ‘a lax consistence’ is on its own no more likely to perform our noble cognitive operations than is ‘a Cake of Sewet or a Bowl of Curds’ (1662 I: 34). Since the limitations even of sluggish matter are so obvious, More argues, it must be pervaded by a universal ‘hylarchic principle’ which works in and through it (Henry 2008). Although this view had some influence on More’s friend Anne Conway (J. Smith 2009), in dealing with human intellect and reasoning More retained a clearer dualist emphasis on the incorporeality of the soul. Even though the subtle animal spirits are a more suitable medium for interaction with immaterial substance than the pineal gland or the solid parts of the brain, More argues, even they cannot themselves have ‘Animadversion, Memory and Reason’. Animal spirits are ‘nothing else than matter very thin and liquid’, capable of nothing but motion, and ‘being loose one from another, fridge and play up and down according to the measure and manner of agitation in them’: therefore they are ‘utterly incapable of *Memory*’, for ‘it is as impossible to conceive *Memory* compatible to such a Subject, as it is how to write Characters in the water or the wind’ (1662 I: 33).

But this concern about memory, central to More’s critique of alternative accounts of body and soul, also reveals a different set of priorities from Digby’s work. Digby had trusted that individuality would be preserved in the afterlife through the reuniting of soul and body by God’s will, since the soul in itself is (p. 299) timeless and forgetful. In contrast, from his earliest poetical works, also written in the 1640s, More had insisted with some concern that the soul itself must retain personal memories after death. Unless this ‘very intimate’ faculty, the ‘very bond of life’, is self-sufficient when independent of the body, the happiness of souls might be abated, as oblivion of all things past cuts away awareness of our own deeds: in such a case, the soul ‘could never tell/Why she were thus rewarded, wherefore ill/Or good she doth enjoy, whether ill or well/She lived here. Remembrance death doth spill’ (1647, stanzas 2, 28–32). This concern continued to animate More’s mature philosophy, in which he argues against Descartes that the soul is extended incorporeal substance. More notes that although in this life animal spirits are a ‘necessary instrument’ of memory, that faculty will be ‘more perfect after death’ (1662 II: 187). He makes a range of detailed suggestions on how the soul preserves, controls, and orders memory impressions, which if left to ‘the bare laws of matter’ would become ‘strangely depraved, if not obliterated’ (1662 II: 93, 105; Sutton 1998). Indeed the second half of the seventeenth century saw a remarkable focus on memory in English natural philosophy, in contexts as diverse as theories of the passions and treatments of hearing and music (Gouk 1991; Kassler 1995): as well as More and Willis, both Joseph Glanvill and Robert Hooke also offered substantial critical and constructive views on how separate events in the past might be retained independently in the brain without interference or confusion (Glanvill 1970 [1661]; Hooke 1971 [1705]; Sutton 1998). Not surprisingly then, memory was also a primary concern, and in similar

contexts, for the last philosopher we briefly consider, John Locke.

Locke's new account of personal identity in the second edition of his *Essay* in 1694 was in part a direct response to the same issues about the preservation of memories at the resurrection. In distinguishing 'man' from 'person', where the person is continuous over time just as long as it can identify itself by way of continuing consciousness, Locke is treating conscious memories as essential for justice, in the divine as in the human realm (Uzgalis 2009). Though officially unwilling, in the context of the *Essay*, to 'meddle with the Physical Consideration of the Mind' (*Essay* I. i. 2), Locke was fully aware of contemporary physiological views. In II. x, arguing that ideas 'are said to be in our Memories, when indeed, they are actually no where', Locke acknowledges that 'the make of our Animal Spirits ... and the Temper of the Brain' are likely to 'influence the Memory'. So when, in the chapter on personal identity (II. xxvii), he wonders if we might 'see the Absurdity of some of these Suppositions' if only we know more about how the soul was 'tied to a certain System of fleeting Animal Spirits', Locke is countenancing threats to the same set of ideas about justice, morality, and happiness that More had raised (Sutton 1998).

However, Locke's epistemological caution ran deep, and like many of his natural philosophical peers he was willing to submit to God's omnipotent pleasure even at the cost of rational understanding. This attitude appears most notably in his (p. 300) famous suggestion about thinking matter. Stressing the limitations of human knowledge about whether or not 'some Systems of Matter, fitly disposed' might or might not have 'a power to perceive and think', Locke argues that it is within God's power, if he pleases, to 'superadd to Matter a Faculty of Thinking' (*Essay* IV. iii. 6; Yolton 1984b). Locke's puzzling references to the possibility of physical or biological thought were among the most influential and controversial through the early decades of the eighteenth century in experimental histories of man, as the direction of philosophical reflection on the mind gradually came to shift (Anstey 2009; Serjeantson 2008). At the end of the century, alongside ongoing traffic across medicine and philosophy on the nature of the soul, natural philosophers and commentators in the wider culture, in Britain as across Europe, continued to discuss the extent of fragility and discontinuity in human cognition, and to delimit the possible ethical responses to their consequent concerns (Fox 1988; Rousseau 2004, 2008; Sutton 2010). Seventeenth-century philosophers had not resolved any of their most pressing psychological, moral, or metaphysical difficulties about body and soul.

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## John Locke on the Understanding

Peter R. Anstey

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### Abstract and Keywords

The chapter examines the views of John Locke on the study of human understanding, focusing on his work entitled *An Essay concerning Human Understanding* and *Of the Conduct of the Understanding*. It highlights Locke's use of the Stoic tripartite division of knowledge into natural philosophy, ethics, and logic, and his emphasis on the importance of the senses in the acquisition of sensitive knowledge of the natural world. The chapter also discusses the normative aims for the study of the understanding, and the relation between understanding and the will.

Keywords: human understanding, John Locke, Human Understanding, sensitive knowledge, natural philosophy, ethics, logic, will

JOHN LOCKE'S *An Essay concerning Human Understanding* remains one of the most important philosophical works ever written. First published in 1690, it appeared in four lifetime editions and was translated into French and Latin before Locke's death in 1704. As its title indicates, it is an essay on human understanding, but just what the human understanding amounts to and how Locke's project fits into conventional disciplinary boundaries are contested issues. The *Essay* is a large, rambling work, 'written by incoherent parcels' (*Essay*: 7) and after publication it was corrected, modified, and augmented over a period of fourteen years. The prospect of condensing its highly sophisticated account of the understanding into a short chapter is daunting, not least because such an enterprise is necessarily selective and unlikely to please everyone. The approach taken here is, admittedly, one of a number of possible takes on Locke's theory.

Locke's writings on the understanding, however, are not confined to the *Essay* as it stands today. He also wrote an important and influential shorter work entitled *Of the Conduct of the Understanding* which appears initially to have been written for inclusion in the *Essay*, but which was not published until two years after Locke's death. Locke's *Essay* and his *Conduct* are the primary focuses of this chapter, the aim of which is to expound and evaluate Locke's views on human understanding. Let us turn first to the broader context of Locke's project.

### (p. 312) 13.1 Background to Locke's Study of the Understanding

In the traditional divisions of the sciences that Locke himself studied, the study of *intellectus*, or the understanding, was part of the speculative sciences (Serjeantson 2008). The speculative sciences were, in turn, one half of the overarching division of knowledge into speculative and operative, or practical, a division that derives ultimately from Aristotle. Yet from at least the early seventeenth century the traditional maps or schemes of knowledge were undergoing serious re-evaluation and critique, and alternative divisions were being proposed. Francis Bacon's *The Advancement of Learning* (1605) and his

revised Latin version of this work, the *De augmentis scientiarum* (1623), are just two examples of attempts to redefine the traditional boundaries.

In particular, the distinction between practical and speculative knowledge and the cognate distinctions between practical and speculative principles and practical and speculative intellects, underwent significant revisions and in some quarters were abandoned altogether. Thus, in England in the 1650s there emerged a new distinction between experimental and speculative philosophy, which had its primary domain of application in natural philosophy, that is, the study of nature (Anstey 2005). This development is very important for understanding the broader context of Locke's project, for in the older scholastic divisions (and for that matter in Bacon's divisions as well), natural philosophy was grouped among the speculative sciences. However, the new distinction between experimental and speculative philosophy was not a division of different types of knowledge, but of different methods of knowledge acquisition. And, as is well known, it was the experimental philosophy that was favoured and practised by the Fellows of the early Royal Society, and it is they who had a profound influence on the intellectual formation of the young John Locke in the decade before he first turned his thoughts to the nature of the understanding.

Locke went up to Oxford in 1652 and his years there coincided with the emergence of the experimental philosophy. One of his closest friends in these formative years was England's leading experimental philosopher, Robert Boyle. Thus, during the period of Locke's intellectual formation, the status of the discipline of natural philosophy, the discipline that included the understanding within its remit, underwent an extraordinarily important change. It ceased being conceived as a speculative science and became, not merely an operative or practical science, but an approach to the acquisition of knowledge of nature that emphasized experiment and observation. Furthermore, while the traditional divisions of knowledge posited the practical and speculative branches as complementary, many of the early proponents of the experimental philosophy saw the speculative method of (p. 313) knowledge acquisition as deeply suspect and problematic. They decried the development of speculative systems based upon first principles that bore no relation to observation and they likewise rejected speculative hypotheses that had no recourse to observation. This overt opposition to speculative philosophy is not prominent in the writings of Robert Boyle, but it is a hallmark of Locke's early methodological writings and became a defining characteristic of the thought of his close friend, the physician Thomas Sydenham (Anstey 2011).

Thus when Locke first turned his mind to the study of the understanding in 1671, the date of the earliest surviving drafts of the *Essay*, the disciplinary status of the study of the understanding had changed significantly and this accounts in large measure for the strong sense of originality that one feels when one considers Locke's *Essay* in relation to previous writings on the *intellectus*. Much more could be said about these changes, but we shall confine ourselves to just two features of the context of Locke's *Essay* before turning to its content. These features are the emphasis on experiment and the role of natural history.

It sounds tautologous to claim that the experimental philosophy promoted experiment as a method of knowledge acquisition, and it is certainly incorrect to say that the experimental philosophers were the first to perform experiments. However, they were the first not only to place experiment at the centre of their method of knowledge acquisition, but also to develop a philosophy of experiment. Locke's *Essay* reflects this emphasis in so far as he often asks his readers to experiment within themselves (*Essay* II. xxi. 47; II. xxiii. 25; IV. vii. 4). In short, Locke came to conceive of introspection, the main tool for acquiring knowledge of the understanding, in experimental terms. Second, the predominant way, though of course not the only way, in which the experimental philosophers in England practised experimental natural philosophy was by the method of natural history. It is hardly surprising then, that not only does Locke recommend this as the only efficacious method of obtaining knowledge of the natural world (*Essay* IV. xii. 10), but that he also conceived of his project in natural historical terms, describing the *Essay* itself as being written according to the 'Historical, plain Method' (*Essay* I. i. 2).

It is clear then that Locke's *Essay*, and indeed his whole project on the understanding, was situated within this new and exciting methodological context of the emergence of the experimental philosophy. And yet, it would be wrong to overemphasize the discontinuities between Locke's approach to the understanding and his scholastic forebears. The first inkling that Locke's is not such a radically new endeavour comes in the final chapter of the *Essay* on 'Of the Division of the

Sciences'. There, Locke uses, not the traditional scholastic divisions of knowledge deriving from Aristotle, but the Stoic tripartite division into natural philosophy, ethics, and logic. There, in his discussion of natural philosophy, he claims that the end of this discipline is 'bare speculative Truth', an allusion to the scholastic inclusion of natural philosophy among the speculative sciences. What are we to (p. 314) make of this? Well, two points need to be stressed. First, Locke's delineation of the contents of natural philosophy, which he uses in a 'more enlarged Sense of the Word', includes 'God himself, Angels, Spirits, Bodies, or any of their Affections, as Number, and Figure, *etc.*' (*Essay* IV. xxi. 2). It is only natural, therefore, to call this broader conception of natural philosophy speculative, in so far as many of its objects are not accessible to the senses.

Second, it would be wrong to think that, while Locke famously emphasized the priority of the senses in the acquisition of sensitive knowledge of the natural world, he at the same time abandoned the scholastic and Cartesian ideal of a demonstrative natural philosophy. From the earliest drafts to the *Essay* itself, Locke repeatedly claims that had we epistemic access to the inner natures of things, their real essences, we would be in a position to construct a demonstrative natural philosophy. Should we know the real essence of hemlock, we would know a priori that it is poisonous (*Essay* IV. iii. 25). Thus, for Locke, the ideal natural philosophy would, in fact, be a speculative science. The problem, which he repeats *ad nauseum* throughout the *Essay*, is that we do not have epistemic access to the inner natures of things, so it is a lost cause to seek after such a science (*Essay* IV. iii. 29).

## 13.2 Normative Aims for the Study of the Understanding

We turn now from the background to Locke's writings on the understanding to the content of those writings, that is, to Locke's theory of the understanding and its application. It is important to stress not merely the content of the theory, but also its application, because from the outset Locke announces a normative dimension to this project, and because the *Conduct* is a work that prescribes how one might best employ the understanding in order to achieve his normative ends.

In the first place, Locke delimits what we might call the epistemological aims of his project. It is an attempt to search out 'the *Bounds* between Opinion and Knowledge; and examine by what Measures, in things, whereof we have no certain Knowledge, we ought to regulate our Assent, and moderate our Perswasions' (*Essay* I. i. 3). In order to achieve this he will do three things: 'enquire into the *Original* of those *Ideas*, Notions, ... which a Man observes, and is conscious to himself that he has in his Mind'; 'shew, what *Knowledge* the Understanding hath by those *Ideas*', including its certainty and extent; and enquire into the 'Nature and Grounds of *Faith*, or *Opinion*' (*Essay* I. i. 3). But these aims are not ends in themselves; rather they are structured with his normative goals in mind. These normative goals (p. 315) include making the mind 'more cautious in meddling with things exceeding its Comprehension' (*Essay* I. i. 4) and knowing how we should conduct our own lives:

Our Business here is not to know all things, but those which concern our Conduct. If we can find out those Measures, whereby a rational Creature put in that State, which man is in, in this World, may, and ought to govern his Opinions, and Actions depending thereon, we need not to be troubled, that some other things escape our Knowledge. (*Essay* I. 1. 6)

It is the governing of both opinions and actions that are Locke's overriding concerns in the *Essay* and the *Conduct*. And these two enterprises are intimately related; for it is only by governing opinions that one is able correctly to employ the will in right conduct. This is expressed unequivocally in the opening paragraph of the *Conduct*:

The last resort a man has recourse to, in the conduct of himself, is his understanding: for though we distinguish the faculties of the mind, and give the supreme command to the will, as to an agent; yet the truth is, the man, who is the agent, determines himself to this, or that voluntary action, upon some precedent knowledge, or appearance of knowledge, in the understanding. (Locke 1823, 3: 205)

Once we are apprised of these normative aims for Locke's study of the understanding, the epistemological content of the



*Essay* can be set in a clearer light. In particular, the doctrines and habits that Locke attacks can be seen as part of a project of ‘epistemic hygiene’ that will facilitate the correct conduct of the understanding. For example, we can see why Locke’s main concern in Book One is not with innate ideas (as is popularly believed), but with innate principles. The critique of innate principles is part of Locke’s broader attack on maxims and principles in general, though the primary assault on principles is developed in the early sections of Book Four. The problem with principles, according to Locke, is that one can develop speculative systems upon them, but because such principles are detached from experience, the theories based upon them are unable to inform us about the way things really are. In short, to acquiesce in innate principles is to misconstrue the nature of the foundations upon which knowledge and opinions must be built. Thus, in Draft A, Locke introduces connate principles in a discussion of the inability of either the plenist or vacuist theories of matter to inform us as to the true nature of matter (Draft A, §27, Locke 1990: 44–6). For this, we must have recourse to experience. It would be hardly likely, therefore, that we would be endowed with innate principles that are of no use for understanding the nature of the world. And so, Locke sets about demolishing the arguments for innate principles. This essentially negative part of Locke’s project is one of the ways in which he is ‘removing some of the Rubbish, that lies in the way to Knowledge’ (*Essay*: 10; cf. *Essay* I. iv. 25).

The same can be said about Locke’s attack at the end of Book Two—added to the fourth edition—on the habit of the association of ideas, his attack in Book Three (p. 316) on the abuse of words, and his attacks in Book Four on the Aristotelian syllogistic and on enthusiasm—the latter also added to the fourth edition. All of these illustrate Locke’s concern with the right conduct of the understanding, which, in turn, will facilitate right conduct of the person.

Locke’s normative aims for his study of the understanding also help explain a number of features of the positive part of his project. For example, his doctrine of sagacity, his repeated emphasis on the love of truth and, more generally, the pervasive nature of the deontological language in Locke’s exploration of the regulation of our assent and opinions. And yet neither the motivations behind Locke’s prescriptions and proscriptions for the conduct of the understanding and for our lives, nor his actual positive theory of the understanding, have excited Locke’s commentators down the centuries. Instead, the focus has been on particular constituent doctrines and thought experiments, such as the primary and secondary quality distinction, the doctrine of substance, the Molyneux problem, the ‘thinking matter’ suggestion, and the discussion of personal identity. Locke’s *Essay* has tended to be plundered for its marvellous philosophical resources, rather than studied for its unified account of human understanding. (See, for example, Lowe 1995, which in spite of its title does not discuss the understanding at all.) Nevertheless, it is to his account of human understanding that we now turn.

### 13.3 The Understanding and the Will

It was common in seventeenth-century philosophy to regard the mind as having two faculties, the understanding or intellect and the will. Moreover, we saw in the preceding discussion of Locke’s normative aims for his project, that in the conduct of our lives, the will is deeply dependent upon the understanding. It is worth quoting the opening paragraph of the *Conduct* in full:

The last resort a man has recourse to in the conduct of himself is his understanding; for though we distinguish the faculties of the mind, and give the supreme command to the will as to an agent, yet the truth is, the man who is the agent, determines himself to this, or that voluntary action, upon some precedent knowledge, or appearance of knowledge, in the understanding. No man ever sets himself about any thing but upon some view or other, which serves him for a reason for what he does: and whatsoever faculties he employs, the understanding, with such light as it has, well or ill informed, constantly leads; and by that light, true or false, all his operative powers are directed. The will itself, how absolute and uncontrollable soever it may be thought, never fails in its obedience to the dictates of the understanding. ... It is, therefore, of the highest concernment that great care should be taken of the understanding, to conduct it right in the search of knowledge and in the judgments it makes. (Locke 1823, 3: 205–6)

(p. 317) This passage, which has barely figured in discussions of Locke's view of the will and motivation (see, for example, Chappell 1994a, 1994b), makes some very strong claims about the dependence of the will upon the understanding. The understanding is said to be the 'last resort a man has in the conduct of himself', 'the will itself ... never fails in its obedience to the dictates of the understanding', indeed all of a man's 'operative powers are directed' by the light of the understanding.

Now, it is well known that Locke's views on the nature of will and its relation to the understanding underwent significant revisions from the first edition of the *Essay* in 1690 to the approved alterations for the fifth (posthumous) edition of 1706 (see Chappell 1994a; Yaffe 2000; Rickless 2000). However, Locke began the *Conduct* in 1697 and continued working on it until his death in 1704. It is safe, therefore, to take this passage as encapsulating his mature position, but in order to unpack it, we need to turn to Locke's discussion of the will and the understanding in the fifth edition of the *Essay*.

According to Locke, both the will and the understanding are faculties, or powers. The will is the power to command the consideration (or forbear the consideration) of any idea, or the power to prefer motion to rest (or vice versa) in some part of the body. The understanding is the power of perception (*Essay* II. xxi. 5). With regard to willing, one can perform an action either by beginning it or by bringing a current action to completion (*Essay* II. xxi. 5). Now, the will and the understanding are discrete powers and cannot act on one another: 'the power of Thinking operates not on the power of Chusing, nor the power of Chusing on the power of Thinking' (*Essay* II. xxi. 18). A thought in the understanding can be the *occasion* for an act of choosing, but it cannot act on the power of the will (*Essay* II. xxi. 19). How then are they related? In his mature view, Locke claims that the will is determined both by satisfaction of current action and by uneasiness. For simplicity's sake we shall focus on uneasiness. Locke describes this as working 'on the Mind to put it upon Action, which for shortness sake we will call *determining of the Will*' (*Essay* II. xxi. 29). Uneasiness is a passion; in fact, it is a form of pain. Uneasiness has an intentional object, such as a future state of affairs. It is this pain in view of future states of affairs that determines, that is, is the cause of, volitions.

Uneasiness, however, is something that the understanding can determine. For, the understanding has the power to alter the passions and to suspend uneasiness. Locke says that the mind has 'a power to *suspend* the execution and satisfaction of any of its desires' and 'is at liberty to consider the [intentional] objects of them' while the particular uneasiness is suspended and 'before the *will* be determined to action' (*Essay* II. xxi. 47). Thus, while the passion of uneasiness determines the will to action, the understanding can determine the passion of uneasiness. Uneasiness, therefore, acts as a kind of causal node linking the will and the understanding. The mind is not subject to the dictates of the will because:

(p. 318) during this *suspension* of any desire, before the *will* be determined to action, and the action ... done, we have opportunity to examine, view, and judge, of the good or evil of what we are going to do; and when, upon due *Examination*, we have judg'd, we have done our duty. (*Essay* II. xxi. 47)

The idea is that after due examination the nature of the accompanying uneasiness will change and this will, in turn, affect the determination of the will. Thus, the thoughts of the understanding might not be able to determine the will, but they are at least 'the occasion of Volition' (*Essay* II. xxi. 19). It is this doctrine that lies behind Locke's claim in the opening sentences of the *Conduct* that: 'The will itself, how absolute and uncontrollable soever it may be thought, never fails in its obedience to the dictates of the understanding. ... It is, therefore, of the highest concernment that great care should be taken of the understanding, to conduct it right in the search of knowledge, and in the judgments it makes'. The understanding provides checks and balances through a careful examination of the object of uneasiness, or desire in general, and is therefore the 'last resort a man has recourse to, in the conduct of himself'.

However, as ever, there is a complication. For, while Locke emphasizes the discrete nature of the faculties of the will and the understanding, he also claims that the will has the power to determine the action of bodies and *thoughts*. And given that the mind is the locus of thought, it is hardly surprising to find that Locke claims that 'the actual choice of the Mind, [can be] the cause of actual thinking on this or that thing' (*Essay* II. xxi. 19). But this implies that the will is implicated in the functioning of the mind as it thinks about this or that thing (cf. *Essay* II. vii. 3; II. xxi. 5). Moreover, thinking about this or that thing is exactly what the understanding must do when it has suspended uneasiness and makes a careful examination of

its object. In fact, in a letter to Philipp van Limborch from September 1702, Locke attributes liberty to some actions of the understanding. He says:

As regards the act of understanding: I surmise that there lurks an ambiguity in that word ‘understanding’, for it can signify an action of thinking about some subject, and in that sense a man is for the most part free in actions of the understanding of that sort: for example: I can think about Adam’s sin, or remove my cogitation thence to the city of Rome ... In all these actions and in countless others of the kind I am free ... Or an act of the understanding can be taken for that action by which I perceive that something is true, and in this action of the understanding ... a man is not free because when the demonstration has been examined he is unable not to understand this. (Locke 1976–, 7: 680–1)

Now, given Locke’s view that every case of liberty of action includes volition as a cause (*Essay* II. xxi. 8; Chappell 1994b: 120), it is difficult to resist the conclusion that, in spite of Locke’s emphasis on the discreteness of the will and understanding, in those situations where the understanding suspends uneasiness, the will actively determines the understanding. The power of the will does not operate on the process of thinking in the understanding, but it can certainly determine the object (p. 319) of that process and for that we can be morally culpable (*Essay* IV. xiii. 1; IV. xx. 16). This is certainly the case for the faculty of judgement in which the understanding ‘ought to examine all the grounds of Probability’ (*Essay* IV. xv. 5). Indeed, this is the core of Locke’s commitment to an ethics of belief. Locke, however, is realistic enough to restrict the scope of his ‘ought to examine’ to those matters of great concernment and not to apply it to every belief formed in our busy lives (*Essay* IV. xvi. 3; IV. xx. 16).<sup>1</sup>

## 13.4 Human Understanding and the Mind

As we have seen, the understanding is the faculty of thinking and the will the faculty of choosing: ‘the *Understanding* and *Will* are two *Faculties* of the mind’ (*Essay* II. xxi. 6; cf. Locke 1823, 3: 205). The understanding is discrete from the will, but in many cases they are mutually dependent on one another for their respective operations. But how is the understanding related to the mind? The most plausible answer to this question is that the understanding is a part of the mind. Let us explore this suggestion in more detail.

The primary referent of the term ‘mind’ in the *Essay* is to faculties of various kinds. Locke’s commitment to, what we might call, a ‘faculty approach’ to the mind is in keeping with the writers of logic in his day, who often identified the mind with the understanding. For example, John Wallis used *mens* and *intellectus* as synonyms in his *Institutio logicae* (1687: 1) as did Henry Aldrich in his *Artis logicae compendium* (1691: 1, 8, 13). Locke is not, at least in the first instance, concerned with the ontological status of the mind, but rather with its powers.

The view that the understanding is part of the mind seems to sit well with Locke’s characterization of the understanding in *Essay* II. xxi. 5, where he says, ‘The power of Perception is that which we call the *Understanding*’. Perception is of three varieties, namely the perception of ideas, the perception of the signification relation between words and ideas, and the perception of the agreement or disagreement between ideas (*Essay* II. xxi. 5).

On this interpretation then, the mind is the possessor of a whole range of powers, and the understanding is one such power of the mind, namely the power of perception. Locke discusses each of these powers of the mind in three consecutive chapters from *Essay* II. ix to II. xi. He begins by claiming ‘Perception, as it is the first faculty of the Mind, exercised about our *Ideas* ...’ (II. ix.1). The next chapter begins, ‘The next Faculty of the Mind, ... is that which I call *Retention*’, that is, (p. 320) memory. Then Locke proceeds to discerning, which is distinguishing between ideas (II. xi. 1); comparing, which involves further powers of comparing (II. xi. 4); composition and enlarging (II. xi. 6); and abstraction (II. xi. 9). He concludes this discussion by claiming ‘[t]hese, I think, are the first Faculties and Operations of the Mind, which it makes use of in Understanding’ (II. xi. 14). It is important that we take the clause ‘makes use of in Understanding’ in the correct way

here where 'Understanding' is a gerund and not a substantive referring to the faculty. The suggestion is, to repeat, that the mind has many powers and one of them is perception, which is the faculty of the understanding.

Interestingly, however, most of the faculties of the mind discussed in these chapters, apart from perception (identified with the understanding in *Essay* II. xxi. 5), are attributed to the understanding. For example, the understanding can *compare* ideas (*Essay* II. xi. 5) and repeat and join ideas together (*Essay* II. xii. 8). The attribution of these faculties to both the understanding and the mind is entirely natural if the former is taken to be a part of the latter: in so far as they are faculties of the understanding, they are also faculties of the mind.

Furthermore, as John Yolton has pointed out (1993: 137, 307–8), there are many contexts where Locke appears to use the terms interchangeably or where there is no perceptible difference in their meaning (see, for example, *Essay* II. i. 24–5). In fact, many of the things that Locke attributes to the understanding, he also attributes to the mind. Locke often speaks of ideas as being both in the mind and in the understanding such that they are both the locus of ideas. For example, Locke claims that '*External Objects furnish the Mind with the Ideas of sensible qualities ... And the Mind furnishes the Understanding with Ideas of its own Operations*' (*Essay* II. i. 5). A similar parallel between the mind and the understanding occurs in Locke's discussion of demonstration. He claims,

where the Agreement and Disagreement is ... plainly and clearly perceived, it is called *Demonstration*, it being *shewn* to the Understanding, and the Mind made to see that it is so. (*Essay* IV. ii. 3)

A few sentences later Locke is claiming 'in *Demonstration*, the Mind does at last perceive the Agreement or Disagreement of the *Ideas* it considers' (*Essay* IV. ii. 4). Again, 'the Understanding turns inwards upon it self, *reflects* on its own *Operations*, and makes them the Object of its own Contemplation' (*Essay* II. i. 8). Then, using almost the same expression, Locke claims that 'the Mind turns its view inwards upon it self, and contemplates its own Actions' (*Essay* II. xix. 1). The mind then, has ideas, perceives the agreement or disagreement between ideas, and reflects upon its own operations. Each of these functions also pertains to the understanding in so far as it is part of the mind.

In the case of introspection, Locke opens the *Essay* with the claim that the understanding can perceive itself, though 'it requires Art and Pains to set it at a distance and make it its own Object' (*Essay* I. i. 1). And, as we have seen, Locke (p. 321) claims that the mind can be the object of perception: 'the *Mind furnishes the Understanding with Ideas of its own Operations*' (*Essay* II. i. 5; cf. IV. xxi. 4).

But can the understanding be an object of the mind? Locke's answer to this question is crucial. For, to be the object of something is to be perceived, but if Locke were to attribute an *additional* perceptive faculty of the mind in order to perceive the perceptive faculty, he would find himself facing a homunculus problem, that is, a vicious regress of perceptive faculties. Consider, however, the following passage:

whatsoever is so constituted in Nature, as to be able, ... to cause any perception in the Understanding, doth thereby produce in the Mind a simple *Idea*; which, ... when it comes to be taken notice of, ... it is by the Understanding looked on and considered there, to be a real *positive Idea* in the Mind ... Thus the *Idea* of Heat and Cold, Light and Darkness ... are equally clear and *positive Ideas* in the Understanding (*Essay* II. viii. 1–2, modified).

In modifying this passage, I have swapped the terms 'mind' and 'understanding' for each other with no substantial change of meaning in the passage. In fact, each of the new expressions, such as 'perception in the Understanding' and '*Idea* in the Mind', are found elsewhere in the *Essay*. This strongly suggests that 'mind' and 'understanding' are being used as synonyms here and elsewhere throughout the *Essay*, and that Locke does not face a homunculus problem. There are not two perceptive faculties, but one. The mind perceives ideas in virtue of the fact that the understanding perceives ideas and nothing more.

## 13.5 The Function of the Understanding

Now while Locke's discussions of the understanding and the mind are dominated by faculty talk, this does not exhaust Locke's interest in the understanding. For, according to Locke, what is most characteristic of the understanding is its role in producing what we might call, for want of a better term, intellectual grasp. Locke says 'if these Words (*to be in the Understanding*) have any Propriety, they signify to be understood' (*Essay* I. ii. 5; cf. I. ii. 22; II. xxi. 20). But understanding, or intellectual grasp, is not a power but the end product of a function. It is the function of the understanding to produce intellectual grasp. Let us call this the 'function approach' to the understanding, keeping in mind that 'function' here is being used loosely and not in the technical sense of biological function.

Two features of Locke's language concerning the understanding reinforce the centrality of the function of the understanding. First, much of Locke's talk about the understanding implies that it is goal-directed. This is particularly true of the (p. 322) *Conduct* where Locke speaks of 'the proper business of the understanding' and 'right use' of the understanding, and repeatedly stresses the weaknesses of the understanding and the ways in which it can be 'misguided' and 'distracted' from its proper function, and how it is often misapplied, debased, and enervated (Locke 1823, 3: 235–7, 257). Locke's overriding concern in these passages is not with the powers or faculties of the understanding, but with its function in providing understanding.

Second, the notion of function in early modern thought is normally intertwined with that of design, and Locke is no exception. Thus we find in the 'Epistle to the Reader', when reflecting on the origins of the *Essay*, he claims that he and his friends reached an impasse in their discussion and it became apparent that 'it was necessary to examine our own Abilities, and see what Objects our Understandings were, or were not fitted to deal with' (*Essay*: 7). In the body of the *Essay* itself, Locke's talk of fittedness normally concerns sensory and cognitive faculties and not the understanding itself (*Essay* I. iv. 24; II. xxiii. 12). But there is a sense in which the 'fittedness' of our senses or memory, etc. is related to their role in the overall goal-directed activity of the understanding itself. That goal is understanding or intellectual grasp.

Now to be sure, Locke sometimes speaks as if the function of the understanding is merely the acquisition of knowledge. In the *Conduct* he tells us that 'There are several weaknesses and defects in the understanding, either from the natural temper of the mind, or ill habits taken up, which hinder it in its progress to knowledge' (Locke 1823, 3: 233). But it is important that we keep the qualitative dimension to knowledge in mind here. Locke sometimes calls it *real* knowledge, as, for instance, in the *Conduct* when he says:

It is in the perception of the habitudes and respects our ideas have one to another that real knowledge consists; and when a man once perceives how far they agree or disagree one with another, he will be able to judge of what other people say, and will not need to be led by the arguments of others, which are many of them nothing but plausible sophistry. This will teach him to state the question right, and see whereon it turns; and thus he will stand upon his own legs, and know by his own understanding. Whereas by collecting and learning arguments by heart, he will be but a retainer to others; and when any one questions the foundations they are built upon, he will be at a nonplus, and be fain to give up his implicit knowledge. (Locke 1823, 3: 236–7, underlining added)

Locke brings this out clearly in his discussions of the value of reading for the conduct of the understanding. For example, again in the *Conduct* he diagnoses the problem with voracious readers who 'make no great advances in real knowledge':

The mistake here is, that it is usually supposed that, by reading, the author's knowledge is transfused into the reader's understanding; and so it is, but not by bare reading, but by reading and understanding what he writ. (Locke 1823, 3: 250, underlining added).

(p. 323) So for Locke, one can acquire knowledge, but *real* knowledge is accompanied by understanding, and it is the function of the understanding to provide this real knowledge. It is natural, therefore, to ask how the understanding goes about acquiring such real knowledge.<sup>2</sup>



## 13.6 The Conduct of the Understanding

Locke has a theory about how the understanding should be employed in order to acquire real knowledge, that is, knowledge with intellectual grasp. Indeed, there is a sense in which the whole of the *Essay* is oriented towards answering this question. As Locke puts it in the final section of Book One: '*To shew how the Understanding proceeds herein, is the design of the following Discourse*' (*Essay* I. iv. 25). He provides a succinct statement of the mechanics of coming to real knowledge in *Some Thoughts concerning Reading and Studying for a Gentleman*:

the next step towards the improvement of his understanding must be, to observe the connexion of these ideas in the propositions which those books hold forth, and pretend to teach as truths; which till a man can judge whether they be truths or no, his understanding is but little improved; and he doth but think and talk after the books that he hath read, without having any knowledge thereby. And thus men of much reading are greatly learned, but may be little knowing.

The third and last step, therefore, in improving the understanding, is to find out upon what foundation any proposition advanced bottoms; and to observe the connexion of the intermediate ideas, by which it is joined to that foundation upon which it is erected, or that principle from which it is derived. This, in short, is right reasoning; and by this way alone true knowledge is to be got by reading and studying. (Locke 1823, 3: 294)

Note here the contrast between being learned and being knowledgeable. Note too, the sequence from observing the connection between ideas that are constituents of propositions to the search for the foundations that propositions 'bottom' upon. This is the process of right reasoning, that is, the operation of the understanding, and 'by this way alone true knowledge is to be got'. But Locke is at pains to emphasize one more point: right reasoning is performed and real knowledge is acquired when the understanding focuses on the way things are in themselves. As he puts it: 'To think of every thing just as it is in itself is the proper business of the understanding, though it be not that which men always employ it to' (Locke 1823, 3: 235). Again, he tells us where clear and distinct ideas and words are to be found: 'he that will conduct his understanding right must not look for [them] in the acuteness (p. 324) of invention, nor the authority of writers, but will find [them] only in the consideration of things themselves' (Locke 1823, 3: 263) What Locke is prescribing here is, first his theory of demonstration, second the analysis of bottoming and third, the observation of things themselves. Let us examine each in turn.

In the *Essay* Locke develops a theory of demonstration as the perception of the agreement or disagreement between two ideas with the help of an intermediate idea. This idea he calls a proof (*Essay* IV. ii. 3). A similar theory had been expounded by Antoine Arnauld and Pierre Nicole in their *Logique* (Arnauld and Nicole 1996: 135–6). The originality of this theory can be gauged by a comparison with the standard tripartite division of faculties of the understanding in logic textbooks of the later seventeenth century. Normally the intellect, or understanding, was said to have the faculty of perception, which apprehends notions or ideas; judgement, which forms propositions from ideas; and reason, which establishes the relations between propositions (see Aldrich 1691: 1–2; cf. Buickerood 1985). By contrast, Locke collapses reason and perception into the one faculty, that which perceives the agreement or disagreement between ideas, and he redefines judgement as the faculty that determines the degree or probability of agreement or disagreement between two ideas when certainty is lacking (*Essay* IV. xiv. 4). Furthermore, into this mix of perception, reason, and judgement, Locke adds another faculty, sagacity, which is the discovering of intermediate ideas or proofs (*Essay* IV. ii. 3). This pre-linguistic account of demonstrative reasoning is proffered by Locke as the correct analysis of demonstration and Aristotelian logic is regarded as a *post hoc* reconstruction of this process in syllogistic form. Knowledge acquired using Lockean demonstration is called demonstrative knowledge. But demonstrative knowledge is not enough to furnish the understanding with real knowledge.

The second thing that Locke prescribes is an analysis of the principles upon which we base our reasonings. In spite of the temporal and epistemic priority of perceiving the agreement or disagreement of ideas as mental propositions, Locke concedes that much of our reasoning is in the form of verbal propositions. In fact, the slide from ideas to verbal propositions is almost irresistible (*Essay* IV. vi. 1; IV. v. 4). As such, most of our reasoning is based upon or bottoms on a small set of

principles, and it is these that Locke believes are the source of many of our gravest errors and inhibitors to the acquisition of real knowledge. The way to avoid this is to dispense with the notion that these principles are innate and to examine the constituent ideas of the propositions and to seek instructive general propositions, including what he elsewhere calls principles that ‘Matter of Fact justifie’ (Locke 1989: 248).

The examination of the constituent ideas of principles is the third ingredient in Locke’s prescription for right reasoning. This involves reflection upon our modal ideas—those ideas that are modes—and our ideas of substances. The latter essentially involves interacting with things themselves, and Locke calls the knowledge derived from interacting with things sensitive knowledge. It is acquired through experience and observation.

(p. 325) Two things should be evident from this brief summary of Locke’s account of the conduct of the understanding in the acquisition of real knowledge. First, there is the prominence of ideas. The importance of the theory of ideas to Locke’s account of the understanding can hardly be overstated. Locke acknowledges this in his *First Reply* to Edward Stillingfleet. He says of the *Essay*

I could not well treat of that faculty of the mind, which consists in thinking, without considering the immediate objects of the mind in thinking, which I call ideas: and therefore in treating of the understanding, I guess it will not be thought strange, that the greatest part of my book has been taken up, in considering what these objects of the mind, in thinking, are. (Locke 1823, 4: 134)

Second is the role of observation and experience in the acquisition of sensitive knowledge. If we are to gain real knowledge about substances, about things in the world, and about ourselves, we must interact with the things themselves. Interestingly, this is exactly what Locke claims he will do in his study of the understanding. From the very way that Locke describes his project it is apparent that the study of the understanding is equivalent to the study of other objects. For at the end of Book One he says, acutely conscious that he is building his own system:

in the future part of this Discourse, designing to raise an Edifice, uniform and consistent with itself, as far as my own Experience and Observation will assist me, I hope, to erect it on such a Basis, that I shall not need to shore it up with props and buttresses, leaning on borrowed or begg’d foundations: Or at least, if mine prove a Castle in the Air, I will endeavour it shall be all of a piece, and hang together. Wherein I warn the Reader not to expect undeniable cogent demonstrations, unless I may be allow’d the Privilege, not seldom assumed by others, to take my Principles for granted; and then, I doubt not, but I can demonstrate too. All that I shall say for the Principles I proceed on, is, that I can only *appeal* to Mens own unprejudiced *Experience*, and Observation, whether they be true, or no; and this is enough for a Man who professes no more, than to lay down candidly and freely his own Conjectures, concerning a Subject lying somewhat in the dark, without any other design, than an unbias’d enquiry after Truth. (*Essay* I. iv. 25, underlining added)

This brings us, finally, to the question of the place of the study of the understanding in Locke’s scheme of the sciences.

## 13.7 Understanding and Locke’s ‘Compass of the Understanding’

The fact that Locke regarded his ‘understanding project’ to be carried out using experience and observation according to the ‘Historical, plain Method’, suggests that, for Locke, the study of the understanding is part of natural philosophy. Indeed, even if the study of the understanding involves a mix of speculation and (p. 326) observation, it remains in the province of natural philosophy. This is the view of John Yolton who views Locke’s project as a blend of ‘speculative truth and empirical truth’ in so far as it is concerned with the intellectual and the material aspects of the understanding. Yolton claims ‘in the *Essay*, Locke is engaged in natural philosophy’ (Yolton 2004: 51). Richard Serjeantson, by contrast, has argued that the *Essay* should be regarded as a logic; that its natural place in Locke’s threefold scheme of the compass of the understanding is in ‘the *Doctrine of Signs*’ (*Essay* IV. xxi. 4; Serjeantson 2008: 170). What are we to make of this disagreement? Just where



does Locke's project fit in his own division of the sciences?

Serjeantson advances two arguments for his claim that the *Essay* is a logic. First, he uses a negative, eliminative argument to show that it is neither a work of natural philosophy nor of ethics. Second, he adduces positive evidence from the content of the *Essay* and from the reception of the work to claim that it is a work of logic. With regard to the first argument, Serjeantson's case against the *Essay* as natural philosophy rests on Locke's claim that 'I shall not at present meddle with the Physical Consideration of the Mind' (*Essay* I. i. 2). However, the fact that physical considerations are not in view does not preclude the understanding from being an object of investigation using the method of experimental natural philosophy. A nice analogy from the period is natural philosophical investigation of the nature of gravity deriving from the work of Newton: the nature of gravity remained a mystery, but did not preclude Newton from discovering many things about it. Locke's own descriptions of his project bear the hallmarks of a natural philosophical enquiry. For example, he told Edward Clarke in December 1686:

Being resolved to examine *Humane Understanding*, and the ways of our knowledge, not by others' opinions, but by what I could from my own observations collect myself, I have purposely avoided the reading of all books that treated any way of the subject, that so I might have nothing to bias me any way, but might leave my thought free to entertain only what the matter itself suggested to my meditations. (Locke 1976–1989, 3: 89)

Locke's collecting of his own observations and his avoidance of the opinions of others lest he be prepossessed are both characteristic of the method of natural philosophy in this period. When we combine this with Locke's claim that his work is written using the historical, plain method, and the fact that he included a summary of his account of the understanding in his *Elements of Natural Philosophy* (Locke 1823, 3: 329–30), it seems most natural to view the *Essay* as being written using the method of natural philosophical enquiry.

But there is still something to be said for the view that the *Essay* is a logic, for when we examine the contents of what, to all intents and purposes, looks like a natural philosophical enquiry, we find that a substantial portion of those contents pertains to Lockean logic broadly conceived. This is nicely brought out by Locke's claim, paraphrased above, that the perceptive faculty of the understanding pertains to three things: the perception of ideas; the signification of signs; and the (p. 327) perception of the agreement or disagreement of ideas (*Essay* II. xxi. 5). These three aspects of the understanding roughly correspond, as David Owen has rightly pointed out, to the contents of Books Two, Three, and Four respectively (Owen 1999: 106–7) and cover the theory of ideas and philosophy of language that are required for Locke's theory of demonstration, that is, the centrepiece of his logic. A happy compromise then is afforded by claiming that the *method* of the *Essay* is undoubtedly natural philosophical, but that the *content* of the *Essay* is in a very real sense that of a logic. If Locke's *intellectus* project really does straddle two of the divisions in his compass of the understanding, this is further testimony to the originality of the work and the manner in which he was able to 'have nothing to bias me any way'. Such a project had never been undertaken before.

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## Notes:

(1) For further discussion see Passmore 1998, Wolterstorff 1996, Losonsky 1996.

(2) Locke uses the term 'real knowledge' in a more constrained and technical sense in *Essay* IV. iv.

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## Ideas

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## Abstract and Keywords

This chapter examines the debates concerning the theory of ideas in Great Britain during the seventeenth century, focusing on the concept, origin, and types of ideas. It explains that the so-called way of ideas that are primarily associated with Rene Descartes and John Locke represent attempts to replace scholastic Aristotelian theories of the nature of the mind and its relation to the world. The chapter also discusses the relevant works of Thomas Hobbes and the Cambridge Platonists, and considers the relevance of skepticism and idealism to the notion of ideas.

Keywords: theory of ideas, Great Britain, Rene Descartes, John Locke, nature of mind, Aristotelian theories, Thomas Hobbes, Cambridge Platonists, skepticism, idealism

IDEAS are central to seventeenth-century discussions of human understanding. What came to be called ‘the way of ideas’, associated primarily with Descartes and his followers on the Continent and Locke in Britain, is the counterpart of the ‘new philosophy’ of matter. The way of ideas represents an attempt to replace scholastic Aristotelian theories of the nature of the mind and its relation to the world, and helped set the framework for many modern debates in epistemology and philosophy of mind.

The way of ideas was famously criticized by Thomas Reid towards the end of the eighteenth century, in the wake of Berkeley’s idealism and Hume’s scepticism. According to a traditional understanding of ideas associated with Reid, ideas are a ‘shadowy kind of beings’ (1969: II. ix, 165) that either draw an impenetrable veil between conscious subjects and the mind-independent material world, or else come to constitute the materials of the world itself. As I will argue, this interpretation not only overlooks the nuances of seventeenth-century theories of ideas, but it misdiagnoses the underlying source of the epistemological problems. The epistemological implications of the way of ideas were already becoming apparent by the end of the seventeenth century: whereas critics associated ideas with the unholy trinity of materialism, scepticism, and atheism, others had begun to embrace the sceptical and idealistic tendencies inherent in the way of ideas. Driving these developments was not so much the reification of ideas into independent entities, but the tendency amongst early modern philosophers to draw a sharp distinction between mind and world.

This chapter attempts to chart some of the many debates surrounding ideas in British seventeenth-century philosophy, focusing on the following three (p. 330) interrelated questions: What are ideas? What is the origin of ideas? What types of ideas are there?

## 14.1 Background

At the beginning of the seventeenth century, scholastic Aristotelianism was the dominant intellectual force in Britain; indeed, it continued to be widely taught in British universities until the second half of the century, much to the displeasure of undergraduates like Hobbes and Locke. Abstracting from the subtleties, and ignoring many substantive disagreements between individuals and schools, scholastic theories of human understanding start with perception. This involves the transmission of the ‘forms’ of sensible qualities of objects, like whiteness, to the sense organs of perceiving subjects. These forms, which in the case of non-contact senses like vision are transmitted between the object and the subject as ‘species *in medio*’, are ‘received’ by the sense organs as ‘intentional forms’ or ‘species’. Once received by the sense organs, these intentional forms can be retained in the (corporeal) imagination as ‘phantasms’, and their essence abstracted by the ‘agent intellect’ to produce ‘intelligible species’, which provide the materials for knowledge. (For a classic scholastic theory of mind, see Aquinas 1964: 1a75–89; for details, see e.g. Pasnau 1997.)

A key feature of scholastic theories of cognition is their explanation of the intentionality (or *aboutness*) of perception and thought. A sensation or thought is *of* (for example) whiteness because intentional species, phantasms, and intelligible species are all, in some sense, *identical* to the form of the sensible quality as it exists in the object; forms, intentional species, phantasms, and intelligible species differ only in their ‘mode of existence’. This means, in effect, that there is no fundamental distinction between things in the world and things in the mind: there is an identity of knower and known. As Aristotle puts it, ‘knowledge is in a way what is knowable, sensation is in a way what is sensible’ (*De Anima* 431b, AR 1: 686).

Scholastic appeals to forms and species were inconsistent with the emerging ‘new philosophy’ of matter, which sought to explain natural phenomena mechanistically in terms of the communication of local motion on impact. One of the figures at the forefront of the revolution was René Descartes (1596–1650). In place of intentional species, which he disparagingly (and no doubt somewhat uncharitably) characterized as ‘little images flitting through the air’ (CSM 1: 153–4), Descartes sought to explain the casual process leading to perception in terms of the transfer of motion from physical objects to the sense organs of perceiving (p. 331) subjects (in the case of non-contact senses like vision, propagated through a medium such as light). Motions in the sense organs were transmitted to the brain, and this in turn caused the occurrence of *ideas* in the mind.

The term ‘idea’ was not new to Descartes. It had previously been used in the Aristotelian tradition to refer to images in the corporeal imagination (as distinct from the intellect), and in the neo-Platonic tradition to designate the archetypes in the divine mind after which God created the world (in effect the Christian equivalent of Platonic forms); it was also used less technically, in a way roughly equivalent to one of its modern uses, to refer in general to the contents of perception and thought (Michael and Michael 1989). At least in his mature writings, Descartes used the term in a way that extended its neo-Platonic use, applying it exclusively to immaterial minds (as distinct from material bodies; e.g. CSM 2: 127, but contrast CSM 1: 106). But he does so with a self-conscious ambiguity. In the ‘objective’ sense, ‘idea’ refers to that which is represented by the mental operations of perception, imagination, and pure thought: for instance, a man, a chimera, the sky, an angel, or God. In the ‘material’ sense, ‘idea’ refers to those mental operations themselves (CSM 2: 7).

Descartes’ use of the term ‘idea’ raises a variety of questions that helped determine the course of much of the subsequent debate. First, Descartes draws a sharp distinction between perception and imagination (modifications of an immaterial substance joined to a corporeal body) and pure thought (which is strictly essential to immaterial substance). Correlatively, he distinguishes between different types of ideas associated with perception and imagination on the one hand and pure thought on the other: for instance, between the confused sensation or imagination of a chiliagon (a one-thousand sided shape) and the clear intellectual representation of it (CSM 2: 50–1). One question is whether there is really a distinct intellectual faculty, and corresponding to it these different types of ideas?

Second, what is the origin of ideas? Given Descartes’ rigid distinction between material and mental substance, it is far from clear how motions in the body *could* cause ideas in the mind. At least on the face of it, this cannot be explained in mechanistic terms as the communication of motion on impact, because immaterial souls are incapable of motion and cannot be impacted upon. Descartes himself sometimes seems to suggest that all ideas, including ideas of sensible qualities like colours, are innate to the mind (CSM 1: 303–4, but contrast CSM 2: 26). But what exactly does this mean, and is it anything

more than an ad hoc attempt to evade the issue of explaining body–soul interaction (e.g. Sergeant 1697: 59)?

Finally, what are ideas themselves? First, what is the relationship between ideas (considered ‘objectively’) and the mental operations of perceiving, imagining, and thinking (ideas considered ‘materially’): are ideas distinct from these operations, or are they really just the same thing considered under different aspects? Perhaps more importantly, what is the relationship between ideas and the objects that they represent? Descartes sometimes seems to suggest the quasi-Aristotelian view that (p. 332) ideas (considered ‘objectively’) are identical with the objects that they represent, and differ only in their manner of existence (e.g. CSM 2: 75). But is this intelligible outside of the context of the scholastic framework of forms and species? If not, what alternative explanation of the intentionality of perception, thought, and hence knowledge, is possible?

## 14.2 Hobbes

Thomas Hobbes (1588–1679), a contemporary of Descartes and author of the Third Objections to Descartes’ *Mediations* (1642), developed the new philosophy of matter into an uncompromising form of materialism. Hobbes’ materialism seems prescient from a modern perspective, but his work cast a long shadow over the seventeenth century: Hobbes’ views were widely criticized, and ‘Hobbist’ became a common term of abuse associated with atheism and moral corruption.

For Hobbes, all knowledge starts with sensation (*Lev.* 1.1, 13). A sensation is an idea—or ‘phantasm’, ‘image’, ‘appearance’, ‘representation’—that is caused when an external object sets into motion the parts of a subject’s sensory organs, and a reaction (or ‘counter-pressure’) to the externally generated inwards motion reverses its direction. Given the mechanistic principle that ‘motion, produceth nothing but motion’ (*Lev.* 1.1, 14), sensations are themselves nothing other than these outwardly directed motions—where, according to Hobbes, the outward direction of the motion explains the outward-looking nature of sensation.

Motions in the brain persist after the object that causes the initial sensation is removed, and these motions constitute imagination, which Hobbes defines as ‘nothing but *decaying sense*’ (*Lev.* 1.2, 15). Other modes of thought are, in turn, defined in terms of imagination. Memory is the name that we give to imagination ‘when we would express the *decay*, and signifie that the Sense is fading, old, and past’ (*Lev.* 1.2, 16). Thought consists in a ‘trayne’, or succession, of images. Finally, understanding is thought ‘rayseed in man ... by words, or other voluntary signes’ (*Lev.* 1.2, 19). As such, sensation, knowledge, and understanding are ‘nothing else, but a tumult of the mind, raised by externall things that presse the organically parts of mans body’ (*Lev.* 2.31, 251).

Hobbes never describes ideas as the *objects* of sensations and thoughts (unlike e.g. Locke, *Essay* I. i. 8); the objects of mental states are the external material objects that are their distal causes (*DCo*, 25.2). Rather, ideas are themselves identical with sensations and thoughts; we simply have two different names that both signify the same thing. In this respect, Hobbes’ view is similar to the orthodox Cartesian view (p. 333) that there is a merely conceptual distinction between ideas considered ‘objectively’ and ideas considered ‘materially’. As Hobbes explains in somewhat scholastic terms: ‘a phantasm is the act of sense, and differs no otherwise from sense than *fieri*, that is, being a doing, differs from *factum esse*, that is, being done’ (*DCo* 25.3).

To the extent that ideas are not independent entities interposed between material objects and modifications of conscious subjects, Hobbes’ theory is ‘direct’, in at least one sense of this treacherous term: we do not perceive or think about material objects *by* or *in virtue of* perceiving or thinking about any distinct entities. Nevertheless, Hobbes insists in contrast to Aristotelian views that ideas (and therefore sensations) are strictly distinct from (distal) material objects: ‘the object is one thing, the image or fancy is another’ (*Lev.* 1.1, 14). As such, Hobbes thinks that ideas of the very same kind are produced by material objects acting on the sense organs, by stimulating the sense organs in the absence of appropriate material objects (‘pressing, rubbing, or striking the Eye’), and by internal ‘distempers’ in dreams and visions (*Lev.* 1.2, 17–18).

Even though Hobbes does not reify ideas into distinct existences, this sharp distinction between objects and ideas is sufficient

to generate acute epistemological problems. If the same sensation can occur regardless of the nature of the object (in cases of illusion), and even if there is no object at all (in dreams and hallucinations), then how can our sensations provide evidence of the nature or existence of material objects? Hobbes' response to the sceptical threat (such as it is) is that we can distinguish sensations from dreams (and other forms of imagination) in terms of their content ('in Dreames, I do not often, nor constantly think of the same Persons, Places, Objects, and Actions that I do waking'), their coherence, and the fact that 'waking I often observe the absurdity of Dreames, but never dream of the absurdities of my waking Thoughts' (*Lev.* 1.2, 17). However, this response is far from sufficient to answer the sceptic. At best it gives a reason to distinguish sensation from imagination; it does not provide a guarantee that sensation is a way of acquiring knowledge about an independently existing external world.

Hobbes' theory of ideas is paradigmatically *imagistic*. This is not to say that ideas are picture-like objects in the head, which at least officially Hobbes denies. Rather it is to say that there is no fundamental distinction in the way in which objects are presented in sensation and thought (e.g. Soles 1999: 48–9): as Hobbes puts it, 'there is no conception in a mans mind, which hath not at first, totally, or by parts, been begotten upon the organs of Sense' (*Lev.* 1.1, 13). In contrast to both scholastic Aristotelianism and Cartesianism, Hobbes denies the existence of an intellectual faculty of pure understanding distinct from the imagination. Correlatively, for Hobbes there are no abstract general ideas distinct from the particular ideas received via sense and retained in imagination: everything that exists is particular, and this applies to ideas no less than objects. In the place of abstract ideas of the pure intellect, Hobbes offers a purely linguistic theory of general thought and knowledge, according to which there is 'nothing in the world Universall but (p. 334) Names', where such names are universal in virtue of the fact that they are 'imposed on many things, for their similitude in some quality, or other accident' and 'recall any of those many' (*Lev.* 1.4, 26; *DCo* 2.9).

Hobbes' imagistic theory of ideas plays a key role in his argument for his materialist theory of mind (Duncan 2009). Hobbes famously rejects the existence of immaterial substances as inconceivable. For Hobbes, the very term 'incorporeal substance' is an oxymoron: 'substance' can mean nothing more than 'body', and to say that a body is unextended is 'contradictory and inconsistent' (*Lev.* 1.4, 30; *Lev.* 3.34, 270; CSM 2: 122). For Hobbes, we can only understand 'thing' and 'substance' as 'material', because it is only ideas of material substances that we receive via the senses. As such, we have no evidence for the existence of incorporeal substances, and mean nothing by the term.

Despite his claims to the contrary, Hobbes was commonly accused of atheism. Denying the existence of an immaterial soul itself contradicted what many regarded as a key tenet of Christianity. Moreover, his argument for materialism based on his imagistic theory of ideas threatened to prove too much. Just as we can have no idea (image) of an immaterial soul, Hobbes concedes that we have no idea of angels or God, either (CSM 2: 126–7). But if the name 'immaterial substance' is an insignificant sound, then it might seem that the same should be true of the names 'angel' and 'God' (e.g. Cudworth TIS: 1.2.5: 63; 1.4.1: 192).

Given these seemingly unacceptable theological consequences, one focus of criticism was Hobbes' imagistic theory of ideas, and his denial of the existence of a distinct intellectual faculty (e.g. CSM 2: 127–8, 129; Cudworth TIS: 636). A related line of argument more directly criticized Hobbes' attempt to explain perception and thought in materialistic terms. The issue was not restricted to the problem of explaining the qualitative aspects of consciousness in materialistic terms, as in many modern discussions of physicalist theories of mind. At least as important was the question of how *knowledge* and *understanding*—cognitive capacities that humans supposedly share with God—could be explained in terms of brute, insensible, matter in motion.

An obvious problem with Hobbes' materialism is that it appears to have the unacceptable consequence that everything that has motion also has sensation and thought (e.g. More 1659, II.ii.1: 124; Cudworth TIS: 731). Hobbes anticipates this objection, arguing that sensation (as distinct from mere motion) requires the ability to compare and distinguish ideas; this in turn requires memory, and as such the sense organs must be 'fit for the retaining of such motion as is made in them' (*DCo* 25.5). However, it is far from clear that memory can play the role that Hobbes requires it to. For one thing, it is not clear that



the constitution of the brain is such that it could retain motion for a sufficiently long time, given that memories can persist for years (e.g. More 1659: II.ii.7, 130–1). Besides, Hobbes himself claims that the mind is not unique in retaining the motion that is impressed upon it: ‘wee see in the water, though the wind cease, the waves give not over rowling for a long (p. 335) time after’ (*Lev.* 1.2, 15). Indeed, Hobbes derives this consequence from an entirely general principle of motion, that ‘When a Body is once in motion, it moveth (unless something els hinder it) eternally’. So it is difficult to see how memory could make the relevant difference between the conscious and the non-conscious, even for Hobbes (Sorell 1986: 74). More fundamentally, appealing to memory does not really address the underlying anti-materialist intuition. Appealing to memory cannot make it any more intelligible that sensation and thought are themselves types of motion, if memory is itself just a different kind of motion (motion that persists after the object that causes it is removed).

## 14.3 The Cambridge Platonists

The Cambridge Platonists were a group of thinkers that included Henry More (1614–1687), Ralph Cudworth (1617–1689), and later the Oxford-based John Norris (1657–1711). Though broadly opposed to scholastic Aristotelianism, the Cambridge Platonists were also staunch critics of what they saw as the atheistic tendencies of the new mechanistic philosophy, exemplified most clearly in the work of Hobbes. Their philosophy of mind and epistemology (like Descartes’ in many respects) was rooted in the neo-Platonic tradition, where human knowledge is explained, more or less directly, in terms of ideas in the mind of God.

Both More and Cudworth attribute the possibility of knowledge to the existence of an immortal soul endowed by God with innate ideas. For instance, in his monumental *True Intellectual System of the Universe* (1678) and his posthumously published *Treatise Concerning Eternal and Immutable Morality* (probably started during the 1660s), Cudworth draws a sharp distinction between the senses and the intellect. Although sensation is an (albeit partially passive) act of the soul, sensation is not sufficient for knowledge, even of particulars. Sensation ‘doth not penetrate into the profundity or inward essence’ of corporeal objects (EIM 3.3.3: 58). Rather, ‘sensory ideas’ or ‘phantasms’ are merely ‘derived from’ their objects (EIM 3.3.5: 60). This is shown by familiar facts about perceptual illusion (EIM 3.4.1: 62–6), hallucinations and dreams (EIM 3.4.2–8: 65–72), and follows from what Cudworth believes to be a genuine insight of the new mechanical philosophy, that colours and other secondary qualities are ‘not qualities really existing in the bodies without us’ (EIM 3.1.3: 51).

Because sensations are distinct from material objects, sensations cannot amount to knowledge (or *comprehension*, which derives from the Latin ‘to grasp’). Following Aristotle, Cudworth accepts as a necessary condition for knowledge the identity of the knower with the known (EIM 3.3.4: 59–60; 4.5.2: 135): it is only (p. 336) if there is no distinction between knowing subjects and the subject matter of their knowledge that the possibility of error is precluded, and absolute certainty is possible. But rejecting Aristotelian appeals to species and forms, for Cudworth the identity of knower and known is achieved by ‘the mind’s looking inward into itself’ at those innate ideas contained within it (EIM 3.3.4: 59–60). The soul contains within itself ideas of ‘the *Intelligible Natures* or *Essences* of things’, under which it brings particulars (TIS: 731). These ideas in turn provide the materials for knowledge of universal or general truths, including mathematical and moral truths.

For Cudworth, ideas are in themselves universal: although Cudworth accepts the nominalistic principle that everything that exists is particular as far as the created world is concerned, the principle does not extend to the ‘intelligible world’ of ideas. Ideas are also eternal and immutable, both in the sense of being independent of particular created objects, independent of the thoughts of particular created thinkers (TIS: 734–8; EIM 4.4.1–6: 122–8). However, this does not mean that ideas are themselves capable of independent existence: they are ‘not dead things, like so many statues, images, or pictures hung up somewhere by themselves alone in a world’. To suppose otherwise is the mistake made by Platonists. For ideas, to be is to be known: their *essi* is *cognosci*. Since ideas are ‘objective notions or knowledges’ they presuppose ‘that actual knowledge in which they are comprehended’ and are therefore ‘modifications of some mind or intellect’ (EIM 4.4.7, 128); like Descartes, Cudworth therefore regards the distinction between ideas considered ‘objectively’ and ideas considered

‘materially’ as merely conceptual. Ideas nevertheless continue to exist when created minds are not actually thinking of them in virtue of God’s all-seeing eye: ‘A sun that never sets, an eye that never winks’ (EIM 4.4.11, 131). The extent to which this pre-empts Berkeley is clearly striking; and although Cudworth is not himself an idealist, it is difficult to avoid the feeling that the material world is vanishing from sight.

Innate ideas (or ‘common notions’) are often described in the seventeenth century as being ‘stamped’, ‘impressed’, ‘inscribed’, or ‘engraven’ (etc.) on the soul, in the way that Scripture describes God’s moral law as being ‘written’ in men’s hearts (Romans 2: 15). But like Descartes (CSM 1: 303–4), Cudworth and More caution against understanding these metaphors too literally—or as More puts it, of thinking of innate ideas as ‘flaring and shining to the animadversive faculty like so many torches or stars in the firmament’ (1653 1.5: 13; see also Cudworth, EIM 4.1.5: 77). For his part, More at least sometimes seems to suggest something like the Platonic view of knowledge as recollection, saying that ideas are innate in the sense that there is ‘an active sagicity in the soul, or quick recollection as it were ... in such a sense as the sleeping Musician’s skill might be called *actual skill* when he thought nothing of it’ (1653: 1.5, 13–14). Cudworth, however, explicitly rejects the Platonic view (EIM 4.1.2: 74). Instead, he suggests a form of ‘dispositional nativism’ (e.g. Yolton 1956: 29, 39), according to which innate ideas are in created minds only ‘virtually and (p. 337) potentially’, in the sense that created minds have an ‘innate cognoscitive power’ to produce these ideas (EIM 4.1.5: 77). Although, as Locke would later argue, it is perhaps not entirely clear exactly what this amounts to, the basic idea is that created minds have the ability to freely and spontaneously, but non-arbitrarily, frame ideas of true and immutable essences, in virtue of the fact that human minds are ‘ectypal models, or derivative compendiums’ of the divine mind (EIM 4.1.5: 77; TIS: 733).

More and Cudworth present versions of two common types of argument for the existence of innate ideas. The first is a type of ‘acquisition argument’: there are ideas in the mind that we could not acquire by sensation (which involves only the transfer of motion on contact), and the best, or perhaps only, explanation of how these ideas could be in the mind is that they are innate. These ideas include ideas of perfect lines and figures; ideas of mental operations, such as sense, thought, reason, knowledge; ideas of relations, such as cause, effect, whole, part, equality, inequality; ideas of merely possible entities; and the idea of God (e.g. More 1653 1.6: 14–17; Cudworth TIS: 732–3; EIM 4.1.8: 79–80). The second type of argument is a form of ‘the argument from universal consent’: there are certain propositions which are universally assented to, at least by people in their right minds when these propositions are first proposed to them, and the best, or perhaps only, explanation of this is that these propositions are innate (More 1653 1.6: 14–17; Cudworth EIM 4.4.12: 131). This was a common form of argument for innate ideas in the seventeenth century, and is often associated (thanks to Locke’s famous criticisms, *Essay* I. iii. 15–19) with Edward, Lord Herbert of Cherbury’s argument for ‘common notions’ in *De Veritate* (1624: 116), a baroque blend of scholasticism and neo-Platonism. I will consider Locke’s criticisms of both these arguments in the next section.

The existence of innate ideas is one of the fault lines that is standardly taken to divide ‘empiricists’ and ‘rationalists’. But one of the problems with this distinction (or at least this way of drawing it) is that thinkers who are plausibly described as ‘empiricists’ sometimes accept the existence of innate ideas (like Boyle, e.g. B 8: 273), whereas thinkers who are otherwise plausibly described as ‘rationalist’ reject them. A case in point is John Norris, best known today for his criticisms of Locke. According to Norris, the claim that there are any such things as ‘*Mental Impressions*, or Characters written upon the mind’—whether they be received from the senses as Locke claims, or directly from God as More and Cudworth claim—is either purely metaphorical or ‘mere *Jargon*, and unintelligible *Cant*’ (Norris 1690: 20). Following Nicolas Malebranche, Norris argues instead that there is an altogether closer relationship between God and man. Whereas More and Cudworth think that ideas in the soul are copies of the archetypes in God’s mind, Norris eliminates these intermediaries altogether, arguing that ‘we see all things in God, or the Divine Ideas, that is, in the partial Representations of the Divine Omniformity’ (Norris 1690: 30). The ‘Vision in God’ was in turn criticized by Locke in three posthumously published sets of remarks—two directed explicitly at Norris, and (p. 338) one at Malebranche (1971, 1823). According to Locke, the Vision in God is the least intelligible of the alternative accounts of human understanding. Although Malebranche’s views continued to influence subsequent writers like Berkeley and Hume, Locke’s prediction that this particular form of neo-Platonism was ‘an opinion that spreads not and is like to die of it self’ (Locke to Peter King, 25 October 1704, Locke 1976–1989, 8: 413) turned out to be largely accurate.

## 14.4 Locke

For many, John Locke's (1632–1704) *Essay concerning Human Understanding* represents the high-water mark of the 'way of ideas'. The purpose of the *Essay* is to 'enquire into the Original, Certainty, and Extent of humane Knowledge; together, with the Grounds and Degrees of Belief, Opinion, and Assent' (*Essay* I. i. 2). The enquiry into the origins of human knowledge is the focus of Books I, II, and to a lesser extent III (the predominant focus of which is language), and this lays the foundation for the enquiry into the nature and extent of human knowledge (and its complement, faith) in Book IV. At the heart of this epistemological enquiry are ideas, which Locke famously characterizes as 'the Object[s] of the Understanding when a Man thinks' (*Essay* I. i. 8).

For Locke, the ultimate *origin* of all knowledge is experience, of which there are two kinds: sensation and reflection. In experience, the mind passively receives simple ideas. Simple ideas are the mental equivalent of corpuscularian atoms (e.g. *Essay* II. ii. 2; II. vii. 10). They are 'uncompounded' (*Essay* II. ii. 1), and so '*not capable of any definitions*' (*Essay* II. iv. 4), and are received either via one sense (e.g. solidity, colour, taste, and smell), by more than one sense (e.g. shape and size), by reflection (e.g. perception, willing, remembering), or by both sensation and reflection (e.g. pleasure, pain, power, existence). The mind is then able to produce complex ideas—of particular substances, modes (or properties), and relations—by a variety of different mental faculties or operations, which include repeating, compounding, decomposing (making compounds of compounds), and comparing. In the case of both simple and complex ideas, the mind has the ability to produce *general* or *abstract* ideas by abstraction. Collectively, these ideas constitute the 'materials' of knowledge.

Knowledge itself relies on the mind's faculty of discerning (*Essay* II. xi. 1), and consists in 'nothing but *the perception of the connexion and agreement, or disagreement and repugnancy of any of our Ideas*' (*Essay* IV. i. 2). The extent of human knowledge is delimited primarily by the stock of ideas with which the human mind is furnished and its ability to perceive their agreements and (p. 339) disagreements—although in a hugely influential chapter added to the fourth edition (1700), reminiscent of Hobbes' discussion of the 'Trayne' or 'succession' of thoughts that constitute 'Mentall Discourse' (*Lev.* 1.3, 20), Locke warns that this ability to perceive agreements and disagreements is something that is liable to be hindered by the mind's propensity to associate by 'Chance or Custom' ideas that have no 'natural Correspondence and Connexion one with another' (*Essay*<sub>4-5</sub> II. xxxiii. 5). But despite being limited in certain important respects, human knowledge is at least sufficient for our purposes, and extends as far as 'Whatsoever is necessary for the Conveniences of Life, and Information of Vertue' (*Essay* I. i. 5).

During the course of the first three Books of the *Essay*, Locke addresses both of the arguments for the existence of innate ideas presented by nativists like More and Cudworth. Book I considers different versions of the argument from universal consent, arguing (at some length) that it fails to establish the existence of speculative principles or propositions (*Essay* I. ii), practical principles (*Essay* I. iii), or their constituent ideas, particularly the idea of God (*Essay* I. iv). Locke argues essentially that the argument from universal consent either has a false premise, because the supposedly innate principles do not receive universal assent, or its conclusion is trivial, because it fails to distinguish the nativist's explanation of universal consent from the empiricist's, which appeals only to innate learning mechanisms and not innate principles or ideas.

Locke's arguments against nativist explanations of universal consent are something of a curate's egg. Locke assumes that there cannot be ideas in the mind of which we are unaware, and hence that if any proposition is innate, then it must receive universal assent, even from 'Children and *Ideots*'. According to Locke, it is 'near a Contradiction, to say, that there are Truths imprinted on the Soul, which it perceives or understands not; imprinting, if it signify any thing, being nothing else, but the making certain Truths to be perceived' (*Essay* I. ii. 5). But although many of Locke's opponents would accept that ideas cannot exist unperceived 'absolutely', nativists like Descartes, More, and Cudworth did deny that innate ideas must be 'actually' present to the mind. Locke is on stronger ground in claiming that nativist explanations of universal consent are trivial, and appeal to nothing more than universally acknowledged innate learning mechanisms: it is perhaps not clear exactly what else it might mean to say that innate ideas are in the mind only 'virtually', 'potentially', 'dispositionally', or 'implicitly'. Nevertheless, as many of Locke's contemporaries complained, Locke is in danger of either attacking a strawman, or else

begging the question against his nativist opponents (e.g. Damaris Masham to Locke, 7 April 1688, 1976–1989, 3: 433; Lowde 1694: 77–81; Burnet 1699: 62–3; for further discussion, see also Yolton 1956: 26–71; de Rosa 2004; Rickless 2007).

Besides, Locke is himself committed to the existence of ideas in the mind of which we are unaware, most notably in his account of memory, as Norris was quick to point out (1690: 7–8). Locke made a number of revisions to the second edition of the *Essay* (1694) in response to this criticism. To avoid the suggestion that ideas (p. 340) enjoy any kind of independent existence (‘our *Ideas* being nothing, but actual Perceptions in the Mind, which cease to be any thing, when there is no perception of them’), Locke explains that ideas are stored in memory only in the sense that the mind has a ‘Power ... to revive Perceptions, which it has once had’ (*Essay*<sub>2–5</sub> II. x. 2). At the same time, he introduces a new argument designed to show that innate ideas could not exist in the mind unperceived in the way that memories do. Locke argues that innate ideas could only exist in the mind unperceived if they were memories. However, whenever an idea is revived from memory, it is ‘with a consciousness, that it had been there before, and was not wholly a Stranger to the mind’ (*Essay*<sub>2–5</sub> I. iv. 20). As none of the ideas that are supposedly innate are accompanied by this additional perception, Locke concludes that there are no innate ideas in memory.

However, this argument is far from convincing. For one thing, the feeling of recollection is neither sufficient for memory, as shown by cases of *déjà vu*, nor necessary for memory, as shown by the fact that we can remember things without being aware that we have previously experienced them. Besides, few of Locke’s nativist opponents would accept that innate ideas are memories (More 1653 is perhaps an exception). Even if we grant Locke that innate ideas are not memories, Locke does nothing to show that ideas could *only* exist unperceived if they were memories (e.g. Leibniz 1996: 78–9). Again, Locke is in danger of either attacking a strawman, or else begging the question against his nativist opponents.

Fortunately for Locke, his case against nativism does not depend entirely on the success of his criticisms of the argument from universal consent. Even if there are some propositions that receive universal consent, this does not prove them to be innate, if the universal consent can be better explained some other way (*Essay* I. ii. 3). Parts of what this involves is diffusing the ‘acquisition argument’ employed by nativists like More and Cudworth, and showing how the mind is able to acquire the ideas that it cannot receive from sensation. This is the task undertaken in Books II and III of the *Essay*. On the one hand, Locke explains the acquisition of ideas of mental operations like perceiving and thinking by expanding the experiential base to include reflection (inner sense) as well as sensation (outer sense). At the same time, Locke argues that simple ideas received via experience can be made into complex ideas by a variety of mental operations. For instance, ideas of simple modes like space can be produced by repeating the same simple idea; ideas of mixed modes like beauty can be produced by compounding different simple ideas; ideas of substances can be produced by compounding a number of simple ideas with the confused idea of substance in general; ideas of relations can be formed by comparing ideas; finally, ideas can become ‘general Representatives of all of the same kind’ by abstraction, which involves considering them separate ‘from all other Existences, and the circumstances of real Existence, as Time, Place, or any other concomitant *Ideas*’ (*Essay* II. xi. 9).

(p. 341) Because of its role in explaining the possibility of knowledge of general truths, Locke’s account of abstraction is of particular importance. One way of seeing Locke’s theory of abstraction is as an attempt to steer a course between the extreme nominalism of Hobbes and the conceptualism of Descartes and the Cambridge Platonists. In contrast to Hobbes, for whom there are no universal ideas but only universal names, Locke introduces abstract ideas to act as the referents of general terms. This allows for the possibility of universal knowledge consistent with Locke’s definition of knowledge as the perception of agreements and disagreements amongst ideas; it also allows for the possibility of communication about generalities consistent with Locke’s claim that the primary signification of words is ideas (*Essay* III. ii). At the same time, Locke diverges from conceptualists like Descartes, More, and Cudworth over both the origin and nature of abstract ideas. As to their origin, Locke thinks that it is evident from considering how our minds ordinarily function that general ideas are derived from ideas of particulars, and not ‘proleptical’ to them (*Essay* III. iii. 9). As to their nature, Locke denies that abstract ideas are of themselves general or universal: universality is ‘accidental’ to abstract general ideas, ‘their general Nature being nothing but the Capacity they are put into by the Understanding, of signifying or representing many particulars’ (*Essay* III. iii. 11; IV. xvii. 8; contrast Chappell 1994: 42).

Even so understood, there are two different ways of understanding Locke's account of abstraction. Following Berkeley (1975 [1710]: Introduction), a traditional interpretation is that abstraction is the opposite of composition, and hence abstract ideas are themselves numerically distinct from the particular ideas from which they are abstracted. According to an alternative interpretation, Locke's view does not differ significantly from Berkeley's own: abstraction consists merely in selectively attending to, or partially considering, particular aspects of ideas of particular objects, and abstract ideas are themselves just particular ideas that act as representatives for objects of the same kind (e.g. Ayers 1991).

The interpretation of abstraction as partial consideration is perhaps more clearly suggested by the discussion of abstraction in Book II (the focus of which is abstract simple ideas), where Locke talks of making abstract ideas from particular ideas merely by '*considering* them as they are in the Mind such Appearances, separate from all other Existences' (*Essay* II. xi. 9, emphasis added). However, Locke elsewhere contrasts 'partial Consideration' with the separate consideration of ideas (*Essay* II. xiii. 13), and the phrase 'considering them ... separate' at *Essay* II. xi. 9 seems to be more suggestive of the latter than the former. Besides, the discussion of abstraction in Book II is less extensive than the later discussion of abstraction in Book III, the focus of which is abstract complex ideas, and the later discussion more clearly suggests the traditional interpretation: Locke talks here of creating abstract ideas by 'separating' them from concomitant ideas (*Essay* III. iii. 6), and 'leaving out but those particulars wherein they differ, and retaining only those wherein they agree, and of those, making a new distinct complex *Idea*' (*Essay* (p. 342) III. iii. 9). Of course, if the traditional interpretation is correct, then there are pressing philosophical problems, as Berkeley pointed out. In particular, Locke seems to be committed not only to the existence of indeterminate ideas, such as the idea of body without any idea of colour, but perhaps even to inconsistent ideas, such the abstract idea of a triangle that 'must be neither Oblique, nor Rectangle, neither Equilateral, Equicural, nor Scalenen; but all and none of these at once' (*Essay* IV. vii. 9). The traditional interpretation therefore comes at a high price (for further discussion see e.g. Ayers 1991; Walmsley 2000).

The interpretation of Locke's theory of abstraction is bound up with the further question of whether Locke is an imagist: that is, whether objects are presented in fundamentally the same way in experience and thought. Again, one way of reading Locke is as trying to steer a course between the extreme imagism of Hobbes and the intellectualism of Descartes and the Cambridge Platonists. Like Hobbes, Locke denies the existence of a distinct intellectual faculty, and with it the existence of ideas proper to the pure intellect. For instance, Locke attempts to diffuse Descartes' argument for the existence of a distinct intellectual faculty—that we are able to clearly conceive, but not clearly imagine, a one-thousand sided chiliagon (CSM 2: 50–1)—by distinguishing the clear idea we have of the number of its sides from the confused idea we have of its figure (*Essay* II. xxix. 13–14). Moreover, as we have seen, Locke denies that abstract ideas are of themselves universal. Yet at the same time, Locke allows for a wider range of mental operations than Hobbes, and so has a more expansive inventory of the mind's ideas. In particular, Locke thinks that we have many ideas which we neither receive directly from sensation, nor from experience (including reflection) more generally: these include ideas of substance in general (*Essay* II. xxiii. 2), immaterial substances (*Essay* II. xxiii. 15), God (*Essay* II. xxiii. 33–5), infinity (*Essay* II. xvii), relations (*Essay* II. xxv), and abstract ideas (*Essay* II. xi. 9; III. iii. 6–9). According to this interpretation, Locke is therefore an imagist, but only an imagist of sorts (compare Soles 1999; contrast e.g. Ayers 1991; Chappell 1994).

Locke's account of the origins of our ideas is central to his account of the extent of human knowledge. In addition to the Cartesian properties of clarity and distinctness (*Essay* II. xxix), Locke identifies three properties that our ideas can possess 'in reference to things from whence they are taken, or which they may be supposed to represent'. Ideas are *real* if they 'have a Conformity with the real Being, and Existence of Things' (*Essay* II. xxx. 1), *adequate* if they 'perfectly represent those Archetypes, which the Mind supposes them taken from; which it intends them to stand for, and to which it refers them' (*Essay* II. xxxi. 1), and *true* if they have 'a Conformity' to those things that the mind tacitly refers them to (*Essay* II. xxxii. 4). Reality and truth are coextensive, but ideas can be derivatively called 'true' or 'false'—terms which 'belong, in Propriety of Speech, only to Propositions' (*Essay* II. xxxii. 1)—in virtue of the truth of the tacit supposition of the conformity of the idea to a thing.

(p. 343) Because simple ideas are received passively in experience, they are all real, adequate, and true. Only simple ideas of



primary qualities (shape, size, solidity, etc.) are ‘Images, or Representations’ of, i.e. ‘resemble’, qualities of objects (*Essay* II. viii). But simple ideas of secondary qualities still represent (*Essay* II. xxx. 2), and represent perfectly, the powers of objects to produce those very ideas: ‘For if sugar produce in us the *Ideas*, which we call Whiteness, and Sweetness, we are sure there is a power in Sugar to produce those *Ideas* in our Minds, or else they could not have been produced by it’ (*Essay* II. xxxi. 2). The epistemological significance that Locke accords to the passive nature of perception is threatened by his admission that the ideas received in sensation are often altered by ‘judgment’ or ‘habitual custom’, as when ‘a variety of shadow and colour, collecting the Figure’ is transformed into the idea of ‘a convex Figure, and an uniform Colour’ (*Essay* II. ix. 8). But whether this fatally undermines the account is debatable, as at least the reality, adequacy, and truth of the unaltered simple ideas are guaranteed (e.g. Bolton 2007: 80–3).

Complex ideas, in contrast, differ in their representational properties. Ideas of modes and relations are also all real, adequate, and true. But this is not because they represent real existents. Instead, it is because they are framed by the mind ‘without reference to any real Archetypes, or standing Patterns, existing any where’ (*Essay* II. xxxi. 3): because they are purely the workmanship of the understanding, there is nothing for them to *fail* to conform to. As such, our knowledge of modes and relations effectively achieves the Aristotelian ideal of an identity between knower and known: these ideas ‘being themselves Archetypes, cannot differ from their Archetypes’ (*Essay* II. xxx. 4), and ‘so having nothing to represent but themselves, cannot but be adequate, every thing being so to it self’ (*Essay* II. xxxi. 3). This guarantees the possibility of demonstrative knowledge in mathematics and morality, where knowledge consists in perceiving agreements and disagreements between ideas of modes and relations (*Essay* III. xi. 16). However, it guarantees moral knowledge at the distinct threat of conventionalism—and unlike Cudworth, whose account of our knowledge of eternal and immutable morality is in many ways similar, Locke cannot forestall the threat of conventionalism by appealing to ideas innately printed on created minds (e.g. EIM 4.4.12: 131).

Finally, complex ideas of substances are all inadequate, and only rarely real and true. Complex ideas are all inadequate because they do not represent substances completely: they fail to represent all the observable properties of objects, and also fail to represent the real essences or inner constitutions of substances on which these observable properties depend (*Essay* II. xxxi. 6–10, 13). Accordingly, Locke thinks that the prospects for scientific knowledge are limited (e.g. *Essay* IV. iii. 9–14), and the dispute between materialists and dualists irresolvable: although we cannot easily conceive of God ‘superadding’ thought to matter, we can no more easily conceive of how bodies in motion could produce ideas in immaterial minds, (p. 344) given that we can only conceive of bodies transferring motion on impulse (*Essay* IV. iii. 6).

What are ideas themselves? Despite their absolutely central role in the *Essay*, Locke says surprising little on this question. Locke introduces the term ‘idea’ as that which ‘serves best to stand for whatsoever is the Object of the Understanding when a Man thinks’, explaining that he uses it (in the broad sense popularized by Descartes) ‘to express whatever is meant by *Phantasm*, *Notion*, *Species*, or whatever it is, which the Mind can be employ’d about in thinking’ (*Essay* I. i. 8; II. viii. 8). The problem with this characterization, however, is that it fails to distinguish between very different accounts of the nature of ideas. In particular, it fails to distinguish between the claim that ideas are themselves distinct objects—for instance, corporeal images traced in the brain, sense-datum-like mental objects, or even ideas in the mind of God—and the claim that ideas are merely acts of understanding considered with respect to their representational contents.

The question of how to understand Locke on this point has exercised readers of the *Essay* ever since its publication (e.g. Norris 1690: 3, 22–6). In places, Locke writes as though ideas are the ‘shadowy kind of beings’ that are the target of Reid’s later criticisms (e.g. Reid 1969 II. ix: 165). In the Conclusion of the *Essay*, for instance, Locke argues that ‘since the Things, the Mind contemplates, are none of them, besides it self, present to the Understanding, ’tis necessary that something else, as a Sign or Representation of the thing it considers, should be present to it: And these are *Ideas*’ (*Essay* IV. xxi. 4; IV. iv. 3). This at least sounds like an argument for the claim that ideas are themselves distinct from both the objects they represent and the mind’s awareness of them. This impression is liable to be reinforced by literal readings of Locke’s description of memory of being ‘as it were the Store-house of our *Ideas*’ (*Essay* II. x. 2), and Locke’s infamous claim that ideas of primary qualities ‘resemble’ qualities of objects, which might seem to suggest that ideas themselves have shape, size, and

solidity (e.g. Jacovides 1999).

However, like Descartes, Hobbes, and Cudworth, Locke elsewhere seems to identify ideas with acts of perception. This is perhaps most notable in the revisions that Locke makes to the discussion of memory in the second edition (e.g. *Essay*<sub>2-5</sub> I. iv. 20; *Essay*<sub>2-5</sub> II. x. 2), and in an addition to the fourth edition (1700) where he describes ideas in Cartesian terms as being ‘*objectively in the Mind*’ (*Essay*<sub>4-5</sub>: 13). Indeed, Locke himself appears to be aware of the common epistemological objection to ‘representative theories of perception’ that interpose ideas between material objects and acts of perception. In posthumously published comments on Malebranche, prompted by Norris’ criticisms of the *Essay*, Locke complains that the view that we directly perceive ideas in God’s mind either leads to scepticism, because we do not perceive material objects themselves, or to idealism, because if God does things in the simplest ways (as Malebranche and Norris claim), ‘what need is there that God should make a sun that we might see its idea in him when he (p. 345) pleased to exhibit it, when this might as well be done without any real sun at all’ (Locke 1823, 9: 221; compare e.g. Yolton 1984; Chappell 1994).

Ultimately, the question of what ideas themselves are might be one to which Locke does not provide a definitive answer (Allen 2010). The brief definition of ‘idea’ in the Introduction to the *Essay* suggests that the question is one that he there intends to set aside. This would be consistent with Locke’s use of the ‘Historical, plain Method’ (*Essay* I. i. 2), which broadly speaking involves prioritizing careful observation and taxonomization over the formulation of hypotheses about essential natures—in effect what Locke does in providing a detailed taxonomy of different types of ideas in Books II and III. Indeed, the question of what ideas are might be one of the issues that Locke thinks is shown to lie beyond the boundaries of human understanding by the epistemological enquiry undertaken in the *Essay*. After all, questions about the nature of ideas are closely tied up with questions about the nature of mind, about which Locke is agnostic. As Locke says in response to Norris’ claim that his failure to define what he means by the term ‘idea’ is a ‘*Fundamental defect*’ of the *Essay* (Norris 1690: 4): ‘Perhaps I was lazy and thought *the plain historical method* I had proposed to myself was enough for me perhaps I had other business and could afford no more of my time to these speculations, nay possibly I found that discovery [the nature of ideas] beyond my reach’ (Locke 1971: 10).

## 14.5 Scepticism and Idealism

By the end of the seventeenth century, charges of scepticism or idealism had become common in inter-Nicene disputes between ‘ideists’—for instance, charges of this kind are made by Cudworth against Hobbes (e.g. TIS: 634–7) and Descartes (e.g. TIS: 716–20), by Norris against Locke (1690: 37–8), and by Locke against Norris and Malebranche (1823, 9: 221).

It was also becoming increasingly common to see scepticism and idealism as implicit in the ‘way of ideas’ as a whole. In his protracted public dispute with Locke, Edward Stillingfleet, Bishop of Worcester (1635–1699), warns that the way of ideas could be used by ‘ill men [like Toland in *Christianity not Mysterious* (1696)] to promote *Scepticism* and *Infidelity*, and to overthrow the *Mysteries of our Faith*’, in particular the belief in the Trinity (1697: 23; cf. Locke 1823, 4: 129). Similarly, the neo-Aristotelian John Sergeant (1623–1704) argued that scepticism is inevitable if we attempt to ground our knowledge of material objects on mere ‘similitudes’ or ‘resemblances’ of them, for if someone were only to see the ‘picture’ of a tree or an apple, ‘what knowledge could it give him, but only of things of a far (p. 346) different nature from a Tree, or Apple, viz. a Cloth, Board, or Paper, thus figured and colour’d?’ (1697: 20). Sergeant proposes returning to the ‘*Manly and Solid PHILOSOPHY*’ of Aristotle (uncorrupted by the Schools), in which knowledge is built on *notions*: the things themselves as they are in the mind (1697: sig. a5<sup>v</sup>). However, Sergeant does little to improve on previous attempts to explain how things can exist in the mind, and by the end of the seventeenth century the tide had turned firmly against Aristotelian theories of human understanding.

Others, however, embraced the epistemological implications of the new way of ideas. Writers such as Joseph Glanvill (1661) and Locke exploited the way of ideas in defence of a mitigated scepticism. Richard Burthogge (1638–1705), meanwhile,



developed the way of ideas into a form of idealism, arguing that we do not know objects as they are in themselves, only as they are ‘in our *Analogie*’ (1678: §9).

The view that ideas of secondary qualities are neither forms of material objects, nor faithful representations of qualities existing without the mind, had become popular in light of developments in mechanistic science. But Burthogge extends the conclusion to all the images of sensation (and imagination), and the meanings, notions, or ideas of the intellect (1678: §11), including even our notion of God (1678: §40). This view of ideas follows from Burthogge’s account of the nature of mind. Burthogge rejects Platonists’ appeals to innate principles or ideas ‘spun out ... of their own Bowels’. According to Burthogge, innate principles (as distinct from faculties of reasoning) are not only unnecessary for directing the mind, but the nativist hypothesis is contrary to experience, as we rarely attend to the general principles that are supposedly innate, and only assent to axiomatic first principles on the basis of *evidence* (they are ‘not assented to naturally, but (as other Propositions are) judicially’, 1678: §74). Instead, Burthogge’s account of the structure of the mind and the origins of its ideas is broadly Aristotelian: ‘Notions of the Minde are *bottomed* on *Sentiments* of Sense; so that as Realities are Grounds to Sentiments, so Sentiments are Grounds to Notions’ (1678: §24). But Burthogge combines this essentially Aristotelian account of the structure of the mind with the claim that the mind’s immediate objects are causal effects of—and hence distinct from—the things themselves. As such, intellectual ideas inherit their dependence on the nature of our cognitive faculties from the sensations that they are derived from.

This is a form of idealism, not scepticism, because the immediate objects of human understanding are ‘*real*’ to the extent that they have their ‘Grounds’ in ‘things without the *Cogitative Faculties*’ (1678: §13). ‘Metaphysical truth’, which consists in conformity of things to archetypes in the mind of God, is unattainable, because ‘He must see the Original, and compare the *Copy* with it, that on Knowledge will affirm *this* to be true’ (1678: §66). Nevertheless, ‘logical truth’, which is ‘the Ground, Motive, and Reason of Assent’, is still within our grasp. This is a notion of truth that, like subsequent idealists, Burthogge understands along broadly coherentist lines, as ‘*objective Harmony*’, or harmony between those impressions and ideas in our minds.

(p. 347) As Burthogge’s form of idealism brings out, the tendency of the way of ideas towards scepticism and idealism was not so much a result of the reification of ideas into independent entities—which as we have seen, many of the proponents of the way of ideas themselves explicitly rejected. Rather, the source of the problem was the tendency to draw a sharp distinction between things in the world and ideas in the mind. For empiricists, ideas are copies of material objects. For neo-Platonists, material objects are copies of ideas. But as copies and their originals are distinct, ideas on neither view logically entail anything about the nature, or even existence, of material objects. Nor can this problem be solved simply by replacing ideas with intrinsically representational mental states, as later writers like Reid would suggest—at least not if these representational states are themselves distinct from the objects that they represent. The gap between mind and world is one of the most philosophically problematic aspects of the early modern legacy.

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## Probable Opinion

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## Abstract and Keywords

This chapter examines the views of seventeenth-century British philosophers on probable opinion. It analyzes the use of the concept of probabilities in law and moral theology, and describes the Anglican writers' use of the probabilities to defend the Christian doctrine. The chapter also considers the relevant work of Thomas Hobbes and highlights the importance of John Graunt's founding of statistics in terms of obtaining inference from quantitative data.

Keywords: probable opinion, probabilities in law, moral theology, Anglican writers, Christian doctrine, Thomas Hobbes, John Graunt, statistics, inference, quantitative data

THE English language uniquely emphasizes the epistemic status of the speaker, according to Anna Wierzbicka's *English: Meaning and Culture*. Speakers of English, very much more than those of every other language, preface their claims with 'I think', 'I guess', 'presumably', and the like; are concerned about the 'reasonableness' of beliefs or courses of action; and use the word 'probably' with a frequency several times that of the corresponding word in other languages. This 'cultural script', Wierzbicka says, can be seen to have developed in English polemical writing in the eighteenth century, and it is clear from the phrases used in the writers of that century that they took on this emphasis on belief and uncertainty from reading John Locke (Wierzbicka 2006: chs 4, 7, 8).

Her emphasis on the role of Locke is correct, but Locke himself was the popularizer of three convergent traditions of thought. One was the legal development of uncertain proofs and the evaluation of the testimony of witnesses; the second, partly built on the first, was the scholastic grading of uncertain or dialectical proofs; and the third was a century of development in which English thought diverged from continental through an increasing attention to reasonableness, reasons, moderation, facts, experiments, and probability.

This chapter begins by surveying the areas in which probabilities were already familiar by 1600, law and moral theology. In those fields, the balancing of reasons, witnesses, and authorities for and against propositions was widely discussed in terms of probability, allowing talk of the strength of reasons on each side. Then the (p. 350) areas are discussed in which English thinkers, much more than continental ones, developed those resources to discuss reasoning in religion, philosophy, and science. Beginning with Chillingworth, Anglican controversial writers used the language of probability to pursue a middle path in Christian doctrine and to defend the reasonableness of Christianity. Hobbes founded his political theory on the risk of attack. Scientific writers, especially Boyle and Newton, carefully tried to distinguish certainty from probability in the evaluation of scientific hypotheses. Building on all these foundations, Locke then gave a succinct summary of the philosophy of probability and situated it within his theory of ideas. A final section of the chapter considers the most truly original English contribution to probabilistic reasoning, Graunt's founding of the science of statistics in the sense of inference from

quantitative data.

## 15.1 Law and Logic

In the seventeenth century, the language of most serious learning was still Latin, and university education was still based on curricula formed by medieval scholasticism. The writers we now read in vernacular languages, such as Locke, were thus formed in, and wrote in reaction to, a settled body of concepts and distinctions which need to be understood to appreciate the new thinkers' originality (or otherwise). That is especially true of probability, where an extensive scholastic theory had been built up over several centuries and had become standard in syllabuses in law and logic. Medieval legal theorists had developed a grading of degrees of evidence ranging from 'indications' and 'suspicions' through 'half proof' (*semiplena probatio*, sufficient to justify interrogation under torture but not conviction) to 'vehement presumptions' and finally full proof. Also standard was the distinction between the highest standard of proof, that in mathematics, and the 'moral certainty' that was the highest attainable about ordinary matters, sufficient for full confidence in acting. It was appreciated that uncertain reasons, while not strong individually, could combine to produce a highly persuasive argument. Ethical theorists in the sixteenth century advanced the theory of 'probabilism', according to which in cases of ethical doubt one might follow an opinion that was merely probable; an opinion could have both 'intrinsic' probability (reasons for it) or 'extrinsic' (the support of authorities) (Franklin 2001: chs 1–4; Shapiro 1983: chs 1–3).

Continental law and its large treatises on presumptions were not authoritative for English law. But the essential concepts of the grading of evidence were (p. 351) incorporated into English law by a number of medieval and later legal authorities. Sir Edward Coke, the leading English legal authority of the early seventeenth century, repeated the classical medieval grading of presumptions:

And many times juries, together with other matter, are much induced by presumptions; whereof there be three sorts, viz. violent, probable and light or temerary. *Violenta praesumptio* is manie times *plena probatio*; as if one be runne throw the bodie with a sword in a house, whereof he instantly dieth, and a man is seen to come out of that house with a bloody sword, and no other man was at that time in the house. *Praesumptio probabilis* moveth little but *praesumptio levis seu temeraria* moveth not at all. So it is in the case of a charter of feoffment, if all the witnesses to the deed be dead (as no man can keep his witnesses alive, and time weareth out all men) then violent presumption which stands for a proof is continuall and quiet possession. (Coke 1628: 6b; later in Macnair 1999: 270–5)

The survival of continental ideas on evidence is still clear at the end of the seventeenth century, for example in the remark of the leading authority, Sir Matthew Hale: 'The evidence at Law which taken singly or apart makes but an imperfect proof, *semiplena probatio*, yet in conjunction with others grows to a full proof, like *Silurus* his twigs, that were easily broken apart, but in conjunction or union were not to be broken' (Shapiro 1983: 180). The continental system was even stronger in Scotland, where juries were not used and presumptions were discussed using continental authorities (Stair 1981: 548, 1011).

Coke and Hale (and to some degree Bacon) however also stressed the differences between English and continental law, especially in their relation to the contentious concept of experience. They accused continental law of being over-theoretical, axiomatic, and subtle, in contrast to the reliance of English law on the vast experience of precedents, and of jurors on their wide experience of matters of fact. Hobbes took the opposite side in this debate, but Boyle drew on the English legal tradition of respect for experience in emphasizing its role in natural philosophy (Sargent 1995: 42–56).

A small proportion of such theory reached wider university syllabuses through the treatment of the 'dialectical syllogism' or 'probable syllogism' in logic textbooks (e.g. Crakanthorpe 1622). For example, Blundeville's 1599 *Arte of Logike* has a short section on 'Probable Accidents, Coniectures, Presumption, Sygnes, and Circumstances', illustrated with such arguments as 'the feast of Bacchus is this day celebrated, ergo there will be many drunken this day' (Blundeville 1599: 87–

8). The 1638 *Logic* of the Jesuit Smiglecki, much used at Oxford, said that multiplying probable reasons can make an opinion ‘infinitely more probable’, but cannot make it certain, any more than making a body ‘infinitely more corporeally perfect’ can make it into a spirit (Smiglecki 1638: 661).

## (p. 352) 15.2 Testimony

Fully one half of Locke’s definition of probability relied upon testimony to fact, and testimony was the first ground of probability he mentioned: ‘Inducements of *Probability*, are of *two sorts*; either concerning some particular Existence, or, as it is usually termed, matter of fact, which falling under Observation, is capable of humane Testimony, or else concerning Things, which being beyond the discovery of our Senses, are not capable of any such Testimony’ (*Essay* IV. xvi. 5).

Centuries of reflection on the reliability of witnesses in legal and religious contexts meant that testimony formed a model of the evaluation of uncertain evidence that could be used to understand new forms of evidence, such as experiments and scientific reports (Shapiro 2002; Shapin 1994, ch. 5). Legal thought was based on two brief texts of the *Digest*, the ancient compendium of Roman law, which called for consideration of the witnesses’ status, character, bias, and responses to examination, the number of witnesses, and how their statements fit with circumstances and common knowledge. Similar statements are standard among legal writers in England (Shapiro 1983: 180–9; Macnair 1999: 254–6; Kassler 2009: 105–8). Coke quotes some Latin legal maxims on testimony: ‘One eye-witness is worth ten by hearsay’, ‘A single voice induces neither proof nor presumption’, ‘When witnesses depose in equal numbers, the more worthy are believed’, ‘On a crime committed in a brothel, frequenters of brothels may be witnesses’ (Franklin 2001: 61). The continental requirement, based on Biblical authority, that conviction for a crime required the concurrent testimony of two witnesses of good character, was not regarded as authoritative in English jury trials, but was well known and sometimes taken seriously (Macnair 1999: 249–54).

Bacon treats of testimony in discussing the too easy crediting of rumours. The ‘facilitie of credite, and accepting or admitting things weakely authorized or warranted’ may apply to ‘a beleefe of Historie, or (as the Lawyers speake, matter of fact)’. He has in mind pious stories of miracles worked by saints, but also writers like Pliny who recount dubious stories of natural history (OFB 4: 26). He does not develop any substantial account of how to evaluate the credibility of testimony, despite its importance in establishing the factual basis of natural history (Serjeantson 1999: 208–11).

The wide knowledge of legal ideas is clear from Boyle’s comment: that

though the Testimony of a *Single* Witness shall not suffice to prove the accus’d party guilty of Murder; yet the Testimony of *two* Witnesses, though but of equal Credit ... shall ordinarily suffice to prove a Man guilty; because it is thought reasonable to suppose, that, though each Testimony *single* be but probable, yet a concurrence of such Probabilities ... may well amount to a Moral certainty. (Boyle 1675, B 8: 282)

Locke summarized legal thinking on tests for the reliability of testimony: relevant are the number of witnesses, their integrity, their skill in presenting the evidence, (p. 353) their purpose, the internal consistency of the evidence and its agreement with the circumstances, and the presence or absence of contrary testimony. As ‘the number and credibility of Testimonies, do more or less agree, or disagree with it, so is any Proposition in it self more or less probable’ (*Essay* IV. xv. 6; Kennedy 2004, ch. 6).

Brief treatments of arguments from testimony were also common in the scholastic logics, but they tended to assimilate testimony to arguments from authority, and hence to rely on a single factor in rendering testimony reliable, the creditworthiness of the witness (Serjeantson 1999: 204–5). An English version of a scholastic logic, by the lawyer Zachary Coke, lists thirteen ‘Canons of human testimony’, beginning with the fact that it does not result in necessary truths and admits of degrees. The canons include:

5. Old testimony is worth more then new.



11. Testimony of a skilfull Artizen, is to be preferred before the testimony of another unskilfull, however famous otherwise. (Coke 1654: 163)

The first of these is certainly not in accordance with the spirit of the age, which came to prefer new observations to old authorities (except in law and religion). The latter advice was taken by the Royal Society's Georgical Committee in its enquiries to experienced husbandmen on agricultural matters (Lennard 1932); Boyle does however point out that the 'Logicians Rule, the Skilfull Artists should be Credited in their own Art' is taken advantage of by alchemists to impose their misconceptions on the public (Boyle 1661, B 2: 277). Boyle understood that the advance of experimental science needed a clear distinction between authority (old and unreliable) and testimony to experiments (new and reliable when used with care) (Serjeantson 1999: 215–17; Shapiro 2002: 253–4).

Thomas Sprat's *History of the Royal-Society of London* (1667) emphasized the communal nature of the establishment of experimental matters of fact, conceiving a crowd present to witness and challenge the repetition of an experiment. Nothing except religious truths could be 'confirmed by stronger evidence' than this:

In almost all other matters of *Belief*, of *Opinion*, or of *Science*; the assurance, whereby men are guided, is nothing near so firm, as this. And I dare appeal to all *sober men*; whether, seeing in all Countreys, that are govern'd by Laws, they expect no more, than the consent of two, or three witnesses, in matters of life, and estate; they will not think, they are fairly dealt withall, in what concerns their *Knowledg*, if they have the concurring Testimonies of *threescore or an hundred*? (Sprat 1667: 100; Dear 1985; examples of real public demonstrations of an antecedently unlikely phenomenon in Golinski 1989)

Hooke says likewise, 'How neer the nature of *Axioms* must all those *Propositions* be which are examin'd before so many *Witnesses*?' (Hooke 1665: sig d1<sup>r</sup>).

As in law, so in scientific disagreements, conflicting testimony could be a nuisance. When the astronomers Auzout and Hevelius referred to the Royal Society their dispute about observations of the comet of 1664–1665, the Society recognized (p. 354) it as a case of 'Controversie being about matter of fact, wherein Authority, Number and reputation must cast the Balance'. Wallis, called to investigate, recommended suspending judgement (Shapiro 2002: 256–7; legal discussion of conflicting witnesses in Macnair 1993).

Testimony later seemed to some a natural field for the deployment of the new quantitative ideas arising from the work of Pascal, Fermat, and Huygens on dice. John Craig's *Mathematical Principles of Christian Theology* (1699) models the mind as a 'moving thing' that is driven by the 'motive force' of arguments and testimonies to move through a 'space' of degrees of assent. He calculates the degree to which a chain of witnesses attenuates the belief in a proposition that they relay. He concludes that credibility in the Bible will have fallen to zero after 3,150 years, thus requiring the Second Coming before that date (Craig 1699; similar in Hooper 1699; Stigler 1986). The reasons remain unclear as to why 'applications' of probability theory to calculating the strength of testimony have all been ridiculous.

## 15.3 Moral Doubts and Probabilism

A substantial part of seventeenth-century discussion of uncertainty and probability, both on the Continent and in England, took place in moral theology. Catholic moral thought, with a bias towards practical advice for confessors, developed an elaborate discipline of casuistry with a detailed study of 'cases of conscience'. As the confessional was seen as resembling a miniature court of canon law, legal concepts were applicable. A standard problem was what is permitted to a doubting conscience. In reaction to strict medieval opinions that one must always follow the safer path in case of doubt, Catholic and especially Jesuit moralists of the late sixteenth and early seventeenth centuries defended probabilism, the doctrine that one might follow an opinion that had some probability, for example the approval of several learned doctors, even if the opposite, more strict opinion, were more probable. Probabilism was held up to caricature by Pascal in his *Provincial Letters* in the

1650s (Franklin 2001, ch. 5).

The determination of mainstream Anglicanism to maintain a position between Catholic and Calvinist created special problems in moral theology. A church in schism could hardly have the same respect for authorities, especially recent ones, as Catholics. So English casuistry avoided probabilism in the sense of reliance on the opinions of doctors, and gave greater weight to the reasons for and against opinions. ‘Trust neither me, nor the adverse part, but the Reasons’, says John Donne (Donne 1930: 30). Donne complains that probabilism indulges the human propensity to intellectual laziness: ‘To which indisposition of ours the casuists are (p. 355) so indulgent, as that they allow a conscience to adhere to any probable opinion against a more probable, and do never bind him to seek out which is the more probable, but give him leave to dissemble it and to depart from it, if by mischance he come to know it’ (Gosse 1899, I: 174).

The word ‘dissemble’ here alludes to the notorious views of the Jesuits on the permissibility of equivocation and mental reservation. The Jesuits were committed to the view that an outright lie was intrinsically wrong, and hence never permissible. But they did regard it as allowable, for sufficient cause, to give answers that were deliberately ambiguous, or to give only part of an answer, ‘mentally reserving’ a continuation of the sentence that would change its meaning. The case for the permissibility of these practices was argued in the *Treatise of Equivocation* of Henry Garnett, the superior of the English Jesuits in the dangerous years around 1600. Admitting that not all doctors approve of mental reservation, he calls the doctrine of probabilism in his support: where there are two probable opinions, ‘A man may without sinne follow either, if it may be done without prejudice of our neighbour; and if one be lesse probable than the other, yet so long as it is within ye compasse of probability’, he may do it if the consequences require it (Zagorin 1990: 195). He means that one may balance a lesser probability of the doctrine of mental reservation against the harm that will follow from answering truly such questions as whether there is a priest hidden in one’s home.

Father Garnett evaded capture for many years, but fell into the hands of the authorities after the Gunpowder Plot. Coke achieved his conviction of complicity in the plot (possibly wrongly), claiming to offer, in the continental phrase, proofs *luciores* (clearer than light) of his guilt.

Who was lax and who strict became curiously reversed in the case of the Oath of Allegiance controversy. After the Gunpowder Plot, James I imposed the Oath to distinguish between loyal Catholics and traitorous ones. Many Catholics complied, but were forbidden to do so by the Pope. Donne suggested that Catholics might like to apply probabilism to the case, and conclude that obedience to the King may be legitimately preferred to obedience to the Pope (Donne 1610: 230–1; Malloch 1962).

The high point of Anglican casuistry actually appeared after Pascal’s *Provincial Letters*, and bears no evidence of being affected by Pascal’s ridicule of casuists. Bishop Jeremy Taylor’s *Ductor dubitantium* (1660) includes some colourful praise of probable arguments:

Probable arguments are like little stars, every one of which will be useless as to our conduct and enlightening; but when they are tied together by order and vicinity, by the finger of God and the hand of an angel, they make a constellation, and are not only powerful in their influence, but like a bright angel, to guide and to enlighten our way. And although the light is not great as the light of the sun or moon, yet mariners sail by their conduct; and though with trepidation and some danger, yet very regularly they enter into the haven. This heap of probable inducements, is not of power as a mathematical and physical demonstration, (p. 356) which is in discourse as the sun is in heaven, but it makes a milky and a white path, visible enough to walk securely. (Taylor 1822, 12: 36–7)

On the issue of the doubting conscience, Taylor is firmly against probabilism, laying down the rule, ‘The greater probability destroys the less’.

## 15.4 Hobbes and the Risk of Attack

A standard case of conscience is the allowability of violence in self-defence when in fear of one's life. Hobbes' political theories were, in a sense, entirely founded on the concept of risk, or danger, although he does not exactly express himself in those terms. The famous phrase in *Leviathan* about the life of man in a state of nature being 'nasty, brutish and short' occurs in a paragraph that attributes that condition to lack of certainty about the effects of actions:

In such condition, there is no place for industry; because the fruit thereof is uncertain: and consequently no culture of the earth; no navigation ... no art; no letters; no society; and, which is worst of all, continuall feare, and danger of violent death; And the life of man, solitary, poore, nasty, brutish and short. (*Lev.* 13: 89)

The remedy is the removal of 'just suspicions' of being attacked. That is a main reason for replacing the state of nature with a compact of civil society under a powerful sovereign.

If a Covenant be made, wherein neither of the parties performe presently, but trust one another; in the condition of meer Nature, (which is a condition of Warr of every man,) against every man, upon any reasonable suspition, it is Voyd: But if there be a common Power set over them both, with right and force sufficient to compell performance; it is not Voyd. For he that performeth first, has no assurance the other will perform after ... But in a civill estate, where there is a power set up to constrain those that would otherwise violate their faith, that feare is no more reasonable; and for that cause, he which by the Covenant is to perform first, is obliged so to do. (*Lev.* 14: 96)

The more elaborate *De cive* at the corresponding place emphasizes even more the concept of the reasonableness of the evaluation of risk: 'for it suits not with reason, that any man should perform first, if it be not likely that the other will make good his promise after; which, whether it be probable or not, he that doubts it must be judge of' (EW 2: 21).

The same reasoning, according to Hobbes, is behind the law's forbidding of pre-emptive first strikes: 'Nature gave a Right to every man to secure himselfe by his own strength, and to invade a suspected neighbour, by way of prevention: but the Civill Law takes away that Liberty, in all cases where the protection of the Law (p. 357) may be safely stayd for' (*Lev.* 26: 200). Hobbes is less than clear on what is to be done when one does reasonably fear that the sovereign lacks the power to protect, or when the protection of the law may not be 'safely stayd for'. A sovereign without power, it seems, has no claim to allegiance; a consequence which was the source of not a little ill feeling between Hobbes and the Royalist exiles in Paris during the Commonwealth. The situation was all the more awkward because the Commonwealth's propagandists were using exactly the same argument. Marchamont Nedham, first a defender of Parliament, then a Royalist, later a Cromwellian, in 1650 rested the case for the Commonwealth on two theses: 'That the Power of Sword is, and ever hath been, the Foundation of all Titles to Government', and, that there was a great improbability of any of the Commonwealth's adversaries, whether Royalists, Scots, Presbyterians or Levellers, ever succeeding in their designs. He estimates it at ten to one against any Royalist attempt to regain power succeeding. The second edition of Nedham's book includes an appendix delightedly quoting Hobbes, whose arguments about the need for a strong ruler, Nedham suggests, could hardly apply to the 'King of Scots' or 'any other Power beside the present' (Nedham 1650: 6, 109).

The language of odds, such as 'ten to one', is used by Hobbes in his brief discussion of induction. Bacon had made much of a method of induction as a cure for the scholastics' hasty generalizations in science, but his induction is not a probabilistic method of inference from particulars to general truths of the kind later discussed by Hume, such as the inference from 'All observed ravens are black' to 'All ravens are black'. It is instead an essentially deductive method like Mill's Methods, which relies on a large range of carefully collected instances to rule in or out laws connecting properties (Carlin 2009: 24–8; Malherbe 1996). The problem of induction in Hume's sense, of asking for the justification of pure inductive inferences such as that involving ravens, was not considered in seventeenth-century British philosophy (though known on the Continent; Franklin 2001: 222–4). Hobbes however does recognize such arguments as probabilistic and goes so far as to assign some of them, in a very casual way, numerical odds: '*experience concludeth nothing universally*. If the signs hit twenty times for one missing, a man may lay a wager of twenty to one of the event; but may not conclude it for a truth' (*Human Nature*, Hobbes 1839, 4: 18).

## 15.5 The Reasonableness of Anglican Christianity

Religious controversy in the post-reformation period was the setting for many of the applications of probability in the two countries that attempted a moderate course in matters of religion, England and Holland. It was in this context that (p. 358) English thought began to take on its typical and much celebrated cast of ‘reasonableness’, ‘compromise’, and ‘practicality’. Seventeenth- and eighteenth-century English thought takes many of its assumptions from a stream of works on the ‘reasonableness of Christianity’, a topic central to the concerns of the most influential writers.

There are some historical causes of this development, such as the long reign of Elizabeth I with her determination to avoid extremes. But its intellectual origins are to be found principally in Hooker’s *Laws of Ecclesiastical Polity* of 1594 (Quinton 1978). What was especially important for later developments was Hooker’s concentration on questions of the sources of knowledge. That was an especially difficult problem for the Church of England, which was searching for a middle way between the authority of ‘Scripture alone’ and that of authoritative Roman tradition. Hooker’s solution was to rely on ‘reasonableness’ and ‘tradition’, except where modification was manifestly necessary. ‘The ground of credite’, he writes, ‘is the credibilitie of thinges credited; and thinges are made credible, eyther by the knowne condition and qualitie of the utterer, or by the manifest likelihood of truth which they have in themselves’ (Hooker 1593: 102). The relationship to later English conservative thought is clear. There is also a relationship to the past, since ‘reasonableness’ and ‘tradition’ are the same as the scholastics’ notions of intrinsic and extrinsic probability.

He classifies the grades of assurance as the scholastics did, and insists many times that assent should be proportioned to evidence: ‘perswasions grounded upon reason are either weaker or stronger according to the force of those reasons whereupon the same are grounded’ (Hooker 1593: 16).

The greatest assurance generally with all men is that which we have by plaine aspect and intuitive beholding. Where we cannot attayne unto this, there what appeareth to be true by strong and invincible demonstration, such as wherein it is not by any way possible to be deceived, thereunto the mind doth necessarily assent, neyther is it in the choyce thereof to do otherwise. And in case these both do fayle, then which way greatest probability leadeth, thether the mind doth evermore incline ... Now it is not required or can be exacted at our hands, that we should yeeld unto any thing other assent, than such as doth answere the evidence which is to be had of that we assent to.

Hooker very cunningly suggests that the Calvinists’ fervour stems from their mistake on this point. Their zeal is a cover for their lack of evidence: ‘whereas the truth is, that how bold and confident soever we may be in words, when it commeth to the point of tryall, such as the evidence is which the truth hath eyther in it self or through prooffe, such is the hearts assent thereunto, neither can it be stronger, being grounded as it should be’ (Hooker 1593: 117).

The Low Countries were responsible for early work on the ‘reasonableness of Christianity’, with its characteristic reliance on design arguments for the existence of God, arguments on the historicity of the Gospels, and rational comparisons (p. 359) between different versions of Christianity. Two of the major writers, the Antwerp Jesuit Leonard Lessius and the Dutch Protestant Hugo Grotius, were translated into English (Franklin 2001: 244–6). The ideas of Grotius’ *On the Truth of the Christian Religion* found their most influential support in England, at least in the longer term. A circle of Anglicans, meeting at Great Tew in the 1630s, maintained the ideas of Hooker and Grotius, of moderate scepticism, toleration, and political conservatism. Though dispersed during the troubled times of the Civil War, their surviving members were influential in the thought of the Restoration church (Beiser 1996, ch. 3). The central writer of the circle was William Chillingworth, whose *The Religion of Protestants a Safe Way to Salvation*, of 1638, is one of the most acute works of Catholic–Anglican controversy. Chillingworth had been converted briefly to Catholicism, and had studied at the Jesuit College at Douai before returning to Oxford and preferment in the Anglican Church. His book, though of course largely taken up with particular points of doctrine, is at bottom an attack on the notion of infallibility, based on considerations about the logic of certainty and probability. Chillingworth argues, like Hooker, that the correct degree of belief in a proposition is the degree proportional to the reasons for it, and that God cannot require more:

God desires only that we believe the conclusion, as much as the premises deserve, that the strength of our faith be equal or proportionable to the credibility of the motives to it. Now, though I have and ought to have, an absolute certainty of this thesis—all which God reveals for truth, is true ... yet of this hypothesis—that all the articles of our faith were revealed by God—we cannot ordinarily have any rational and acquired certainty, more than moral, founded upon these considerations: first, that the goodness of the precepts of Christianity, and the greatness of the promises of it, show it, of all other religions, most likely to come from the Fountain of goodness. And then, that a constant, famous, and very general tradition, so credible, that no wise man doubts of any other which hath but the fortieth part of the credibility of this; such and so credible a tradition tells us, that God himself hath set his hand and seal to the truth of this doctrine, by doing great, and glorious, and frequent miracles in confirmation of it. Now our faith is an assent to this conclusion, that the doctrine of Christianity is true; which being deduced from the former thesis, which is metaphysically certain, and from the former hypothesis, whereof we can have but a moral certainty, we cannot possibly by natural means be more certain of it than of the weaker of the premises; as a river will not rise higher than the fountain from which it flows. (Chillingworth 1840: 81)

God is not even morally permitted to require certainty of belief where it is not to be had.

In the course of arguing that fallible beliefs are sufficient for action, Chillingworth gives the essentials of Pascal's wager, in considering the balance of an infinite future happiness and the present inconveniences necessary for attaining it:

For who sees not that many millions in the world forego many times their present ease and pleasure, undergo great and toilsome labours, encounter great difficulties, adventure upon (p. 360) great dangers, and all this not upon any certain expectation, but upon a probable hope of some future gain and commodity, and that not infinite and eternal, but finite and temporal? Who sees not that many men abstain from many things they exceedingly desire, not upon any certain assurance, but a probable fear, of danger that may come after? What man ever was there so madly in love with a present penny, but that he would willingly spend it upon any little hope, that by doing so he might gain a hundred thousand pounds? And I would fain know, what gay probabilities you could devise to dissuade him from this resolution. And if you can devise none, what reason then or sense is there, but that a probable hope of infinite and eternal happiness, provided for all those that obey Christ Jesus, and much more a firm faith, though not so certain, in some sort, as sense or science, may be able to sway our will to obedience, and encounter with all those temptations which flesh and blood can suggest to avert us from it? (Chillingworth 1840: 430–1)

He argues too that the Catholic doctrine of infallibility is logically incoherent, since, being not fully evident from scripture, it needs to be supported by reasoning drawn from scripture and tradition which is not itself certain. He argues that Catholics in any case make salvation rest on fallible grounds, since they require that one receive the sacraments from priests, who are real priests only if descended by a chain of valid ordinations from the apostles. That this is so is uncertain; Chillingworth employs some sophisticated probabilistic argument:

In fine, to know this one thing you must first know ten thousand others, whereof not any one is a thing that can be known, there being no necessity that it should be true, which only can qualify any thing for an object of science, but only, at the best, a high degree of probability that it is so. But then, that of ten thousand probables, no one should be false; that of ten thousand requisites, whereof any one may fail, not one should be wanting, this to me is extremely improbable, and even cousin-german to impossible. So that the assurance hereof is like a machine composed of an innumerable multitude of pieces, of which it is strangely unlikely but some will be out of order; and yet if any one be so, the whole fabric of necessity falls to the ground: and he that shall put them together, and maturely consider all the possible ways of lapsing, and nullifying a priesthood in the church of Rome, I believe will be very inclinable to think, that is a hundred to one, that amongst a hundred seeming priests, there is not one true one: nay, that it is not a thing very improbable, that amongst those many millions, which make up the Romish hierarchy, there are not twenty true. (Chillingworth 1840: 131–2)

In the course of exposing the contradiction between Catholic demands for infallibility in one place with its reliance on



probabilities when convenient, Chillingworth makes an original use of numerical odds as a metaphor for the varying strengths of probabilities:

you take occasion to ask, ‘shall I hazard my soul on probabilities, or even wagers?’ As if whatsoever is but probable, though in the highest degree of probability, were as likely to be false as true! Or, because it is but morally, not mathematically, certain, that there was such a woman as Queen Elizabeth, such a man as Henry VIII, that is, in the highest degree probable, therefore it were an even wager there were none such! By this reason, seeing the truth of your whole religion depends finally upon prudential motives, which you do but (p. 361) pretend to be very credible, it will be an even wager that your religion is false. And, by the same reason, or rather infinitely greater, seeing it is impossible for any man (according to the grounds of your religion) to know himself, much less another, to be a true pope, or a true priest; nay, to have a moral certainty of it; because these things are obnoxious to innumerable secret and undiscernible nullities, it will be an even wager, nay, (if we proportion things differently), a hundred to one, that every consecration and absolution of yours is void ... you have confounded, and made all one, probabilities, and even wagers. Whereas any ordinary gamester can inform you, that though it be a thousand to one that such a thing will happen, yet it is not sure, but very probable. (Chillingworth 1840: 295–6)

Chillingworth’s skill in argument caused some apprehension even among his own party. Locke suggested every gentleman should read him to learn the principles of correct reasoning (Locke 1989: 320–1). The essentials of such ideas on probability became a staple of moderate English natural theology in such influential authors as John Wilkins and John Tillotson (Shapiro 1969: 229–34; Ferreira 1986, ch. 2; Reedy 1993: 90–2).

## 15.6 Scientific Hypotheses: Certain or Probable?

The new experimental paradigm of scientific research, pursued especially in England, posed a number of problems for the probability of the knowledge arising. Medieval science had relied on confronting theory with generally known and widely accessible experiences, such as that heavy bodies fall. That was satisfactory for those sciences where conceptual analysis dominated, such as geometry, the mathematics of motion, and economic analysis. It meant however that medieval and Renaissance science was weak in such areas as chemistry and the physics of fluids, where there is little progress without precision measurement and controlled experiment. In arguing from the highly contrived experiments needed in those sciences, scientists like Boyle and Newton faced three logical problems. The first was that the reliability of testimony came to the fore, since an experiment is a particular historical occurrence, not easily and cheaply repeated, which has to be reliably reported on so as to found knowledge solidly. Like a marvel but unlike common experience, it needs credible testimony to support it, though unlike a marvel it is repeatable. The second is that experiments, being particular, create a problem as to their inductive generalizability: having observed a consistent effect several times, what is the reliability of the belief that the same will be observed under the same conditions again, perhaps in distant times and places? Thirdly, having established such generalizations, what is their relation to the postulation of (p. 362) hidden causes such as atoms or mechanisms to explain them? Are those hypotheses on unobserved causes established, probable, or beyond our knowledge? Those three problems threatened, individually and collectively, to render science merely probable, and posed the problem of explaining why, if they implied that science was not fully certain, they did not imply further that it was completely uncertain.

The first two problems were generally run together. Locke for example maintains that concurrent reliable testimony is sufficient to establish with the ‘highest degrees of probability’ both particular matters of fact (‘Thus, if all *English*-men, who have occasion to mention it, should affirm that it froze in *England* the last Winter, or that there were Swallows seen there in the Summer, I think a Man could almost as little doubt of it as that Seven and Four are Eleven’) and generalizations (‘the regular proceedings of Causes and Effects in the ordinary course of Nature’ subject to constant observation, such as that iron sinks in water and swims in quicksilver) (*Essay* IV. xvi. 6).

Hypotheses as to hidden causes—whether atoms, Aristotelian essences, or occult qualities—were another matter entirely.

Boyle puts the logical difficulty clearly with Descartes' example of different arrangements of clockwork lying behind the same visible phenomenon: 'For as an Artificer can set all the Wheels of a Clock a going, as well with Springs as with Weights ... So the same Effects may be produc'd by divers Causes ... and that it is a very easie mistake for Men to conclude, that because an Effect may be produc'd by such determinate Causes, it must be so, or actually is so' (B 3: 255–6; Schoen 2002; van Leeuwen 1963: 94–5). In addition there was a need to distinguish science based on experiment from the 'speculative' philosophy of nature of the scholastics (Anstey 2005). Any inference to unseen hypotheses risked falling back into the bad old days of purely speculative 'science'.

Locke took a generally negative view of hypotheses concerning causes. He does speak somewhat positively of the corpuscularian theory in view of its explanatory success—it 'is thought to go farthest in an intelligible Explication of the Qualities of Bodies; and I fear the Weakness of humane Understanding is scarce able to substitute another'—but even that is in the context of the general impossibility of assurance about hidden causes (*Essay* IV. iii. 16; Farr 1987; Halabi 2005). Locke expresses a generalized scepticism about, if not all scientific hypotheses in principle, at least actually existing ones: 'probable hypotheses' may have their uses, for example as aids to memory, but 'take care that the Name of *Principles* deceive us not, nor impose on us, by making us receive that for an unquestionable Truth, which is really, at best, but a very doubtful conjecture; such as are most (I had almost said all) of the *Hypotheses* in natural Philosophy' (*Essay* IV. xii. 13; for Locke's restriction of science to natural history and practicalities, see IV. xii. 10 and Anstey 2003).

Newton draws a sharp division between scientific knowledge and speculation at the same place as Locke. Induction from experiment, observation, and measurement may establish such general truths as the elliptical paths of planets and the (p. 363) inverse square law of gravitation. But attempts to find the cause of gravity, such as an ether pressing inwards, though possibly worth pursuing amount only to hypotheses (Newton 1952, Query 21: 350–2). Similarly with light: there are the established generalizations about, for example, the different degrees of refraction of different colours, expressible in mathematical terms, and then there are the several uncertain hypotheses that might explain them:

But I knew, that the *Properties*, which I declar'd of *Light*, were in some measure capable of being explicated not only by that [corporeal hypothesis], but by many other Mechanical *Hypotheses*. And therefore I chose to decline them all, and to speak of *Light* in *general* terms, considering it abstractly, as something or other propagated every way in streight lines from luminous bodies, without determining, what that Thing is. (Newton 1958: 118–19; van Leeuwen 1963: 110–13)

Yet scientists found themselves unable to give up entirely the search for real insight into the hidden springs of nature, at least with a high degree of probability. Boyle states his aim 'to make it Probable to you by Experiments ... That almost all sorts of Qualities ... may be produced Mechanically ... the Doctrine (or rather the *Hypothesis*,) which is to be Collated *with*, and to be either Confirmed, or Disproved by, the Historical Truths, that will be deliver'd concerning Particular Qualities (& Forms)' (B 5: 302–5). Signs of an excellent hypothesis include sufficient grounds, auxiliary proofs, simplicity and the lack of alternatives, and successful predictions (S: 119).

As might be expected from one with an unrivalled insight into nature, Newton was not prepared to concede much to uncertainty. His considered view on the question is that in a paragraph of the celebrated Query 23, appended to the second (1706) edition of his *Opticks*. Centuries of debate as to Newton's views in the Query have been occasioned, in part, by an ambiguity as to what sort of scientific theory about causes can be established conclusively—whether theories previously thought speculative causal hypotheses might actually be capable of proof. Newton begins with an assertion ('it seems probable to me') that much of physics is rightly explained by supposing matter composed of tiny solid massy impenetrable and indestructible particles endowed with gravitational force and other principles as necessary to explain other properties such as cohesion. The causes of their having such properties remain unknown, but 'I scruple not to propose the Principles of Motion above-mention'd, they being of very general Extent, and leave their Causes to be found out'. He then launches into a methodological comment:

As in Mathematicks, so in Natural Philosophy, the Investigation of difficult Things by the Method of Analysis,



ought ever to precede the Method of Composition. This Analysis consists in making Experiments and Observations, and in drawing general Conclusions from them by Induction, and admitting of no Objections against the Conclusions, but such as are taken from Experiments, or other certain Truths. For Hypotheses are not to be regarded in experimental Philosophy. And although the arguing from Experiments and (p. 364) Observations by Induction be no Demonstration of general Conclusions; yet it is the best way of arguing which the Nature of Things admits of, and may be looked upon as so much the stronger, by how much the Induction is more general. And if no Exception occur from Phaenomena, the Conclusion may be pronounced generally. But if at any time afterwards any Exception shall occur from Experiments, it may then begin to be pronounced with such Exceptions as occur. By this way of Analysis we may proceed from Compounds to Ingredients, and from Motions to the Forces producing them; and in general, from Effects to their Causes, and from particular Causes to more general ones, till the Argument end in the most general. This is the Method of Analysis: And the Synthesis consists in assuming the Causes discover'd, and establish'd as Principles, and by them explaining the Phaenomena proceeding from them, and proving the Explanations. (Newton 1717, Query 31: 380–1; related texts discussed in McGuire 1970)

It is clear that Newton believes ‘analysis’ delivers well-established general conclusions, including conclusions about causes (and without the need for any further confirmation by their predictions). What is less clear is whether that extends to causes as hidden as corpuscles, or whether it is restricted to more evident and measurable causes such as gravity (as distinct from any further causes of gravity). The impression Newton leaves, in the context, is that it does so extend. But the ambiguity as to whether it does is—it may be suspected—deliberate. That impression is confirmed by Newton’s several changes of mind in draft when he, following Boyle, tackles the awkward question of what properties of macroscopic bodies can be extrapolated to the sub-microscopic world: why should the corpuscles be conceived to possess extension but not colour (Anstey 2000: 54–8; Shapiro 1993: 42–6)?

## 15.7 Locke on Probable Opinion

For Locke, probability is crucial because of the narrow compass of what can be known with certainty: ‘So in the greatest part of our Concernment, [God] has afforded us only the twilight, as I may so say, of *Probability*, suitable, I presume, to that State of Mediocrity and Probationership, he has been pleased to place us in here’ (*Essay* IV. xiv. 2; Ashcraft 1969).

Locke’s *Essay concerning Human Understanding* contains a short chapter on probability, followed by a longer one on the degrees of assent. The distinction between the two is clear: degrees of assent are psychological entities, probabilities are objective reasons for beliefs, and the relation between the two is that ‘Our Assent ought to be regulated by the grounds of Probability’ (IV. xvi. 1; alleged confusions in this distinction in Wolterstorff 1996: 48–50). Locke’s account of both probability and assent is generally traditional. The basic ground of probability is that expressed in the Aristotelian phrase, what happens ‘for the most part’; even the (p. 365) reliability of testimony depends on it, as when we believe what a geometer tells us about a result whose proof we do not understand because he is not ‘wont to affirm anything contrary to, or besides his Knowledge’ (IV. xv. 1). The grounds of probability are two: ‘The conformity of anything with our own Knowledge, Observation and Experience’, and testimony (IV. xv. 4). ‘Conformity’ means similarity to other observed cases: ‘if another tells me he saw a Man in *England* in the midst of a sharp Winter walk upon Water harden’d with cold; this has so great conformity with what is usually observed to happen, that I am disposed by the nature of the thing itself to assent to it’. But a King of Siam, told by a Dutch ambassador that water in his country froze, refused to believe it; on Locke’s account, reasonably (IV. xv. 5). The mere opinion of others, though often influential, is not a genuine ground of probability.

Locke situates probabilistic as much as demonstrative reasoning in his theory of ideas, by emphasizing that both concern the agreement or disagreement of ideas rather than the syllogistic following of chains of propositions. Probabilistic reasoning, which requires the balancing of intuitively felt reasons for and against the agreement of two ideas, is particularly unsuited to formal syllogistic reasoning (IV. xvii. 4, 5, 16).

As was also traditional, Locke graded the degrees of assent rather finely, but qualitatively: ‘such different Entertainment, as we call *Belief, Conjecture, Guess, Doubt, Wavering, Distrust, Disbelief*, etc.’ (IV. xvi. 9). Reaching the correct degree on the evidence is not easy, even with goodwill and a desire to know, because it involves balancing the often numerous reasons for and against. And in addition, there is the threat of further yet unknown relevant evidence: ‘in matters of Probability, ’tis not in every case that we can be sure, that we have all the Particulars before us, that any way concern the Question; and that there is no evidence behind, and yet unseen, which may cast the Probability on the other side, and outweigh all, that at present seems to preponderate with us’ (IV. xvi. 3). The most genuinely difficult cases for evaluating probability, however, are two: firstly, where evidence conflicts, for example where testimony contradicts common experience (IV. xvi. 9) and secondly, where we make conjectures about matters beyond observation and hence not supportable by testimony, such as whether there is life on other planets or hypotheses about unseen causes, where we must rely on very fallible though not useless arguments from analogy (IV. xvi. 12).

Locke does go beyond the tradition in one respect: in discussing whether belief in a probable opinion is voluntary. That in turn raises moral problems of uncertain belief (Ayers 1991, 1: 106–10). In principle, and for clear cases, Locke holds that assent is involuntary: ‘As Knowledge, is no more arbitrary than Perception: so, I think, Assent is no more in our Power than Knowledge ... and what upon full Examination I find the most probable, I cannot deny my Assent to’ (IV. xx. 16). In practice, however, where there is some balance in the reasons for and against a proposition, and there is reason to believe one is not in command of all the relevant (p. 366) evidence, ‘there Assent, Suspense, or Dissent, are often voluntary Actions’ (IV. xx. 15). From a moral perspective, there is then scope for criticism of those who stop enquiry into the reasons on both sides too early, and of those who give undue weight to slight grounds for doubt (IV. xx. 14).

On the other hand, one may excuse those who have genuine difficulties finding the truth, given the difficulties of evaluating probabilities in many cases. Toleration of the opinions of others is therefore indicated. Given that one must have opinions without indubitable proofs of them, and that one should not give up an opinion merely because one learns of a contrary argument that one cannot immediately answer, one should extend peace and friendship to those who persist in what one takes to be errors: ‘At least those, who have not thoroughly examined to the bottom all their own Tenets, must confess, they are unfit to prescribe to others; and are unreasonable in imposing that as Truth on other Men’s Belief, which they themselves have not searched into, nor weighed the Arguments of Probability’ (*Essay* IV. xvi.4; Rogers 1992; similar ideas less explicitly in the *Letters on Toleration*: Owen 2007) But those with unreasonable and dangerous opinions, such as Catholics and atheists, are excluded from toleration (Schulman 2009).

On questions of faith, Locke follows Chillingworth’s distinctions: ‘I crave leave to say with Mr. Chillingworth, “that I do heartily acknowledge and believe the articles of our faith to be in themselves truths as certain and infallible, as the very common principles of geometry and metaphysics. But that there is not required of us a knowledge of them, and an adherence to them, as certain as that of sense or science”’ (Locke 1823: 4, 275; Helm 1973; Snyder 1986; Wolterstorff 1996: 118–33).

In the fourth edition of the *Essay* (1700), Locke added a new chapter attacking ‘Enthusiasm’. Like Hooker, he diagnoses a failure to proportion assent to probability in uncertain matters. Thus some psychological explanation of an enthusiast’s fervour in his belief is called for: ‘whatsoever degrees of Assent he affords it beyond the degrees of that Evidence, ’tis plain all that surplusage of assurance is owing to some other Affection, and not to the Love of Truth’. Where Hooker had suggested doubt in his own salvation as the explanation, Locke prefers too great self-esteem, enthusiasts having ‘often flatter’d themselves with a perswasion of an immediate intercourse with the Deity’. Naturally, having deliberately distorted their own belief, enthusiasts are keen to impose their opinions on others (*Essay* IV. xix. 1, 2, 5).

Not everyone was happy with the rising tide of probabilities. One of the victims of the intolerance of Catholics approved by Locke was the Aristotelian John Sergeant, Secretary of the Catholic Chapter in London, who several times had to hide and flee abroad. Against Locke and the other Anglican ‘Probability Men’, he vigorously defended demonstrative certainty in philosophy and infallibility in religion. He attacked ‘Books of Philosophy, nay, *Volumes*, blown up to a vast Bulk with *Windy*

and Frothy *Probabilities*, and petty inconclusive *Topicks*; which, like *Rank Weeds*, have over-run that Rich Soil where *Science* ought to have been *Sown*' (Sergeant 1697: Preface, sig. a6). He is sarcastic at the idea of a merely morally (p. 367) certain rule of faith (Krook 1993: 9, 85, 123). Probabilities, he alleges, 'are not capable of any [right measure]; but, like desultory *Ignes-fatui*, whiffle now to this side, now to that ... so that none can take their just Dimension, or Proportion' (Sergeant 1697: 451; Krook 1993: 124). History was not on his side.

## 15.8 Mathematics of Dice and Bills of Mortality

The significance of the mathematical results on dice of Pascal, Fermat, and Huygens in the 1650s (the latter translated in Arbuthnot 1692) took some time to become clear. Historians of mathematics see a 'dark ages of (mathematical) probability' from the time of those initial discoveries till the publication of major treatises after 1700, particularly Bernoulli's *Ars conjectandi*. In that period, combinatorial results on dice were largely taken to be curiosities of recreational mathematics, of little significance for understanding uncertainty in general. Newton answered a dice problem posed by Pepys—not entirely correctly (Stigler 2006; some probabilistic reasoning by Newton on biblical chronology in Sheynin 1971)—while Thomas Storde's 1678 *Short Treatise of the Combinations, Elections, Permutations and Composition of Quantities* improved in some respects on Pascal's combinatorial results (Storde 1678; Stigler 1988). One writer who saw some possibilities in using the new results on dice as a model for uncertainty was Richard Cumberland, who argued that while the selfish strategy he attributed to Hobbes might succeed occasionally, it would not do so in the majority of cases, just as a man who wagers to throw two sixes on the first throw of two dice might succeed, but would have odds of 35 to 1 against doing so (TLN; Stigler 1988).

Of much greater interest is the work of Graunt, Petty, and Halley on bills of mortality, which initiated the science of statistics as opposed to probability—in this context, probability refers to inference from causes to observations (for example from biases in dice to expected relative frequencies in series of throws), while statistics means the reverse, inference from observations to causes (for example, from sample to population proportions in opinion polling).

The Baconian ideal of practical knowledge based on observation and experiment could lead, in one direction, to careful scientific experiments and the collection of natural history observations from distant places. But if one were to pursue philosophy 'like a Lord Chancellor', as Harvey said of Bacon (Aubrey 2000: 143), one would be just as interested in enquiries on the management and reform of society based on inferences from the kind of data now called statistical and economic. The lack of understanding of such possibilities meant that there was little data collected (p. 368) in the early seventeenth century, and hence few opportunities for analysis. A vision of what might be done was promoted by William Petty, who after exposure while young to the advanced Dutch economy and contact with Hobbes, was given charge of the information management aspects of Cromwell's plundering of Ireland. Besides massively enriching himself, he completed a large survey of Ireland which convinced him of the necessity of statistical information for making governmental decisions (Fox 2009; Stone 1997, ch. 1; Mykkänen 1994). He recognized the need for the information to be quantitative, writing in his *Political Arithmetick* (1676, published 1690):

The Method I take ... is not yet very usual; for instead of using only comparative and superlative Words, and intellectual Arguments, I have taken the course (as a Specimen of the Political Arithmetick I have long aimed at) to express my self in Terms of *Number*, *Weight*, or *Measure*; to use only Arguments of Sense, and to consider only such Causes, as have visible Foundations in Nature. (Petty 1690: sig. a3<sup>v</sup>?a4<sup>r</sup>)

On the basis of partial records for poll and other taxes he attempted to reach estimates for such quantities as the population of Ireland. The amount of extrapolation and guesswork is excessive and his conclusions sometimes fanciful, but the demonstration of what might be reached on the basis of sound data was convincing. Equally valuable was his attempt to use the data to investigate causal questions of economics, such as why Irish agricultural labour was less productive than English although there was more land per person. Work of a similar nature was undertaken by Gregory King in the 1690s in his

estimates of national wealth and population, by which time there was more data to hand but still no serious investment in the collection of reliable and complete statistics (Taylor 2005; Stone 1997, ch. 3).

A more critical approach to inference from statistical data was taken by Petty's associate John Graunt in his investigation of the London bills of mortality. Graunt shared with Petty a Baconian perspective and a determination to reach reasonable conclusions from imperfect data (Kreager 1988), but had a better appreciation of the pitfalls, and a conception of how to avoid them by bringing different data to bear on the same conclusion. The data available to him consisted of weekly figures on deaths in London from 1603, classified by causes of death as estimated by 'ancient matrons, sworn to their office'. For the later part of the period there were also records of burials and christenings (Church of England only) for each sex, and some comparative bills of mortality for a few country parishes. He begins by printing yearly tables of the data. The tabular form and the reduction of data to summary figures are both substantial advances in allowing data to be understood. He understands that there are problems with the reliability of the data, for example the underreporting of deaths from syphilis because of the shame of the disease, but he attempts to allow for data problems and investigate such hypotheses as 'that the more sickly the year is, the less fertile of births'. He recognizes that a major problem (p. 369) lies in the lack of knowledge of the size of the population of London, complicated by the fact that it was increasing strongly in the period 1603–1660 and was affected by temporary emigration in plague years. He estimates the population of London by three methods: from Christenings, from burials, and from multiplying the area of a map of London by estimates for the number of houses per unit area and the number of people per house; he finds (suspiciously close) agreement among the three methods (Graunt 1662; Hald 1990: chs 7–8).

Contemporaries were particularly interested in Graunt's attempt to construct from the information on mortality (which did not record age of death) a life table (that is, a table of the average ages of people's deaths or probability of death, as is needed to base life insurance premiums on data). The project was completed more successfully in 1693 by Edmond Halley, who had available mortality data from Breslau that did include age of death (Halley 1693; Hald: 131–41). The foundations were laid for the slow progress of statistical methods.

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## Logic and Demonstrative Knowledge

Douglas M. Jesseph

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### Abstract and Keywords

This chapter examines the views of seventeenth-century British philosophers on the notion of logic and demonstrative knowledge, particularly Francis Bacon, Thomas Hobbes, and John Locke, offering an overview of traditional Aristotelianism in relation to logic and describing Bacon's approach to demonstration and logic. It also analyzes the contribution of the Cambridge Platonists and evaluates the influence of Cartesianism. The chapter concludes that theorizing about logic and demonstrative knowledge followed an arc familiar from other branches of philosophy such as metaphysics or the philosophy of science.

Keywords: logic, demonstrative knowledge, Francis Bacon, Thomas Hobbes, John Locke, Aristotelianism, Cambridge Platonists, Cartesianism, metaphysics, philosophy

A standard topic in seventeenth-century British epistemology was the nature of demonstrative knowledge, together with related questions on how best to understand the role of logic. The British philosophers whose writings on these subjects were the most influential include Francis Bacon, Thomas Hobbes, and John Locke; yet it would be a mistake to think that theirs were the only significant contributions to the philosophical literature on this issue. The influence of traditional Aristotelian views on logic and demonstration was very strong, particularly in the first half of the century. From mid-century on, the adoption of some characteristically Cartesian ideas played a considerable role, and the views of the so-called 'Cambridge Platonists' were likewise of significance in the development of British philosophy in this period.

My account here is divided into seven sections. The first is an overview of the traditional Aristotelian background; the second analyses Bacon's approach to logic and demonstration; section three investigates the influence of Cartesianism; the fourth section analyses Hobbes' radically nominalistic account of the subject; section five briefly examines the contribution of the Cambridge Platonists, while the sixth section takes up Locke's philosophy of logic and demonstrative knowledge. Section seven offers a short conclusion on seventeenth-century British approaches to logic and demonstration.

### (p. 374) 16.1 The Aristotelian-Scholastic Background

The traditional account of logic and demonstration focused on the work of Aristotle, and particularly his works on logic and methodology commonly known as the *organon* (Greek for 'instrument'). The six works of the *organon* (*Categories*, *On Interpretation*, *Prior Analytics*, *Posterior Analytics*, *Topics*, and *Sophistical Refutations*) range widely over themes in epistemology, philosophy of language, philosophy of science, and metaphysics, as well as pure logic or the formal theory of

inference.<sup>1</sup> The long tradition of commentary and exegesis of Aristotle had the result that the great majority of logic texts printed and studied in Britain in the first half of the seventeenth century focused on topics familiar from Aristotle. Among these were the classification of syllogisms by figure and mood,<sup>2</sup> the nature of the five ‘predicables’,<sup>3</sup> the ontological status of the fundamental categories,<sup>4</sup> and the distinction between demonstrations τοῦ ὅτι and τοῦ διότι.<sup>5</sup> Popular logic texts in Britain in this tradition included Pierre Du Moulin’s *Elementa Logica* (1622), Bartholomew Keckermann’s *Gymnasium logicum* (1626), Robert Sanderson’s *Logicae artis compendium* (1615), and Franco Burgersdijk’s *Institutionum logicarum libri duo* (1626), all of which follow the model of the Aristotelian *organon* by intermingling metaphysics, theories of language, psychology, and general methodology with catalogues of valid syllogistic inference forms.

The methodology of demonstration that developed from this basis can be readily summarized. A proper demonstration must begin with first principles that articulate the fundamental nature or essence of the things whose properties are demonstrated, and these principles must contain axiomatic truths that enable the derivation of further results. The truth of such principles is guaranteed by the fact that they are clearly evident to reason—anyone understanding the words used (p. 375) will immediately grasp that these principles are not merely true, but necessarily true. Other truths are derived from such first principles by the use of truth-preserving syllogisms, and this procedure thereby guarantees that any result demonstrated is at least as secure as the first principles themselves. Isaac Barrow, the first Lucasian Professor of mathematics at Cambridge and a staunch defender of traditional Aristotelian methodology,<sup>6</sup> offered a typical assessment of the nature of demonstrative science in his *Mathematical Lectures*:

As regards the premises of every scientific discourse, these are either first principles or conclusions derived by a continued series from first principles; which, after having been so derived, have the force of the principles themselves, and occupy the place of principles with respect to any conclusions that may be inferred from them or proved by their means. For the entire force of any demonstrative reasoning is resolved into the certitude and evidence of the first principles: all the truth, all the soundness, and all the evidence of any science whatever adheres to these inseparable roots, and depends upon these unshaken foundations. (Barrow 1860, 1: 105)

Mathematics (and more specifically geometry) was the salient model of a demonstrative science in this period, and much of the discussion of the nature of demonstration took Euclidean geometry as its point of departure. The Euclidean apparatus of definitions, postulates, and axioms was a paradigm collection of self-evident first principles in seventeenth-century thought,<sup>7</sup> and the derivation of theorems was typically regarded as an exercise in rigorous logical deduction. Demonstrative knowledge was not, however, confined to the mathematical case; many held out the hope that metaphysics or ethics could be demonstrated.<sup>8</sup>

Although logic was generally held in high regard in seventeenth-century Britain, the science was not without its critics. In particular, the association between logic and traditional scholastic teaching (which gradually began to seem outmoded) together with the practice of formal disputation (which often degenerated into incomprehensible wrangling over arcane terminology) made logic a target of much ridicule. John Webster’s 1654 *Academiarum Examen* is a high point of polemic against traditional logic. Webster announced:

(p. 376) As it is now used in the *Schools*, [logic] is merely *bellum intestinum Logicum*, a civil war of words, a verbal contest, a combat of cunning, craftiness, violence and altercation, wherein all verbal force, by impudence, insolence, opposition, contradiction, derision, diversion, trifling, jeering, humming, hissing, brawling, quarreling, scolding, scandalizing, and the like, are equally allowed of, and accounted just, and no regard had to the truth, so that by any means *per fas aut nefas*, they may get the Conquest, and worst their adversary, and if they can intangle or catch one another in the Spider Webs of *Sophistical* or fallacious argumentations, then their rejoicing and clamour is as great as if they had obtained some signal Victory. (Webster 1654: 33)

In point of fact, the very close connection between Aristotelian views on logic and more general metaphysical theses (such as the nature of the predicables or the categories) meant that there was often a perceived link between logic and metaphysics. As Aristotelianism (and especially Aristotelian metaphysics) faced opposition from innovators or ‘moderns’ in

the early seventeenth century, its associated accounts of inference, demonstration, and methodology became subject to serious question. Bacon is the foremost example of this change in thinking about logic, and we can now turn to a consideration of his conception of inference and demonstration.

## 16.2 Bacon and the Project of a New *Organon*

If the Aristotelian *organon* was the framework for the received view on logic and demonstrative knowledge in the early seventeenth century, Bacon's 1620 *New Organon* stands out as a fundamental repudiation of the Aristotelian approach. In Bacon's view, traditional logic is flawed on two related counts. First, it is powerless to guide the mind to the discovery of new truths, since a valid syllogism can yield nothing by way of conclusion that was not already contained in the premises. Second, the first principles from which traditional logic proceeds are insufficiently secure to ground any real knowledge. The result, in Bacon's view, is that the search for genuine knowledge has been seriously hampered by dependence on the Aristotelian account of logic and method.

Bacon's claim that Aristotelian logic fails to yield anything new is a familiar complaint raised by others of the period who sought a 'method of discovery' that would complement the 'method of demonstration' that the syllogistic offered.<sup>9</sup> In brief, the issue comes down to this: although reliance on valid syllogistic inferences (p. 377) was taken to be an effective means of demonstrating consequences that follow from assumed premises, it offers no means of discovering anything new. In other words, Aristotelian logic might be a fine way to organize what one already knows into a demonstrative science, but it lacks the power to guide one to the discovery of new truths. In place of the syllogism, Bacon offered a method of 'inductions' that would uncover fundamental truths by a painstaking ascent from particulars.<sup>10</sup> He expressed the difference between the traditional method and his own in these words:

There are and can be only two ways of searching into and discovering truth. The one flies from the senses and particulars to the most general axioms, and from these principles, the truth of which it takes for settled and immovable, proceeds to judgment and to the discovery of middle axioms. And this way is now in fashion. The other derives axioms from the senses and particulars, rising by a gradual and unbroken ascent, so that it arrives at the most general axioms last of all. This is the true way, but as yet untried. (*New Organon*, 1: 19; SEH 4: 50)

The complaint that the method 'now in fashion' proceeds by fleeing from the senses and ascending immediately to 'the most general axioms' echoes Bacon's second complaint against traditional logic, namely that it relies upon first principles that are either false or too uncertain to serve as the basis of any real knowledge. Bacon's fundamental point is that traditional logic does not employ first principles free from any tincture of uncertainty (as Aristotelian method supposes), but instead elevates commonly accepted prejudices or erroneous received notions to axiomatic status. As Bacon summarizes the case:

The logic now in use serves rather to fix and give stability to the errors which have their foundation in commonly received notions than to help the search after truth. So it does more harm than good.

The syllogism consists of propositions, propositions consist of words, words are symbols of notions. Therefore if the notions themselves (which is the root of the matter) are confused and over-hastily abstracted from the facts, there can be no firmness in the superstructure. Our only hope therefore lies in a true induction. (*New Organon*, 1: 12, 14; SEH 4: 49)

An instance of what Bacon had in mind here would be the astronomical first principle that heavenly bodies move with uniform circular motion. This principle is accepted without subjecting it to critical examination, but once in place it requires a complex apparatus of epicycles to make planetary theory align with astronomical observation. It is admittedly something of a stretch to see the difficulty here as entirely owing to a misuse of logic: the acceptance of a questionable astronomical principle is hardly dictated by logic alone and is better characterized as something accepted on insufficient evidence. Still, Bacon's point can be restated (p. 378) as the claim that the traditional requirement that scientific knowledge be generated

demonstratively from first principles can admit erroneous (if plausible) first principles. The methodological emphasis on induction was Bacon's prescription for discovering first principles whose truth was impeccably established, although it was by no means the only alternative to traditional methodology that was pursued in the seventeenth century.

## 16.3 The Cartesian Influence

Bacon's reservations were not the only critique of the traditional conception of logic and demonstration. In particular, Descartes' views on logic had important points of similarity with the Baconian treatment of the subject. Like Bacon, Descartes objected that the logic of 'the schools' could offer nothing new beyond what was already known, and that reliance on the syllogism was a distraction from the true business of seeking truth. Although Descartes' influence was vastly greater on the Continent than in Britain, he had a significant impact on the development of British philosophy, either as a source of doctrines endorsed by later thinkers or as a target of objections raised by others.

The Cartesian complaint against traditional logic is set out in greatest detail in his *Regulae ad directionem ingenii*, which was written in the 1620s but not published until 1701. Nevertheless, some of the critiques of logic penned in the *Regulae* are discernible in published works, most notably the *Discourse on Method* of 1637. The critique of traditional logic (the work of 'dialecticians') is summarized in the tenth rule:

But to make it even clearer that the aforementioned art of reasoning [i.e. syllogism] contributes nothing whatever to knowledge of the truth, we should realize that, on the basis of their method, dialecticians are unable to formulate a syllogism with a true conclusion unless they are already in possession of the substance of the conclusion, i.e. unless they have previous knowledge of the very truth deduced in the syllogism. It is obvious therefore that they themselves can learn nothing new from such forms of reasoning, and hence that ordinary dialectic is of no use whatever to those who wish to investigate the truth of things. Its sole advantage is that it sometimes enables us to explain to others arguments which are already known. It should therefore be transferred from philosophy to rhetoric. (Rule 10; AT X: 406; CSM 1: 36–7)

In the *Discourse* Descartes expresses this criticism of logic in the complaint that syllogisms 'are of less use for learning things than for explaining to others the things one already knows or even ... for speaking without judgement about matters of which one is ignorant' (*Discourse* 2; AT VI: 17; CSM 1: 119). This is the (p. 379) familiar objection that logic can add nothing to one's knowledge, but at best serves as a tool for organizing what one already knows. In place of this traditional logic, Descartes proposed his famous 'rules of method' in the second part of the *Discourse*.<sup>11</sup> Indeed, in the 1647 French version of his *Principles of Philosophy*, Descartes referred to the *Discourse* as a work 'where I summarized the principal rules of logic' (AT IXB: 15; CSM 1: 186).

Descartes' project differs significantly from the traditional notion of demonstrative science: rather than emphasizing syllogistic deductions from first principles, he focused on the discovery of new truths by a method intended to proceed from incontrovertible principles to novel results. Descartes did not, however, completely abandon the traditional notion that a deductive science such as geometry could be constructed on the basis of clearly grasped first principles. In the fifth of his *Meditations*, Descartes outlined an account of inference based on 'true and immutable natures' found in the mind. In considering the features of a triangle that are capable of demonstration he remarks:

When, for example, I imagine a triangle, even if perhaps no such figure exists, or has ever existed, anywhere outside my thought, there is still a determinate nature, or essence, or form of the triangle which is immutable and eternal, and not invented by me or dependent on my mind. This is clear from the fact that various properties can be demonstrated of the triangle, for example that its three angles equal two right angles, that its greatest side subtends its greatest angle, and the like; and since these properties are ones which I now clearly recognize whether I want to or not, even if I never thought of them at all when I previously imagined the triangle, it follows



that they cannot have been invented by me. (AT VII: 64; CSM 2: 44–5)

These ‘true and immutable natures’ are innate concepts stored in the mind, and the process by which they are recognized is typically termed intuition—an immediate, non-inferential understanding. A deductively valid argument provides an inferential link between premises and conclusion that is itself intuitible, so that the Cartesian approach to logic takes intuition as the fundamental concept in logic rather than formal rules of inference catalogued in traditional accounts of the syllogism.<sup>12</sup>

Descartes’ account of logic and demonstrative knowledge made its way into the British philosophical scene largely through his *Discourse on Method*, but there were also efforts to systematize a Cartesian logic that would serve as a counterweight to the traditional Aristotelian account.<sup>13</sup> Antoine LeGrand published a popular (p. 380) version of Cartesianism as *Philosophia veterum e mente Renati Descartes, more scholastica breviter digesta* (1671). The work was published in London and appears to have been a widely consulted text at English universities. His approach was to take Cartesian philosophical doctrines and recast them in the four-part form of a scholastic textbook: metaphysics, logic, natural philosophy, and ethics. LeGrand’s work was popular both on the Continent and in Britain, going through several editions in the 1670s and 1680s, and appearing in English translation as *An Entire Body of Philosophy according to the Principles of the famous Renate Descartes* (1694). The reaction of British thinkers to the Cartesian philosophy of logic and demonstration is a significant element in seventeenth-century British philosophy, and we can now consider some aspects of this reaction.

## 16.4 Hobbes’ Nominalism

The philosophy of Thomas Hobbes is profoundly opposed to both Cartesianism and traditional Aristotelianism, and nowhere is the contrast more stark than in Hobbes’ approach to logic and demonstration.<sup>14</sup> The root of the disagreement between Hobbes and both the Aristotelians and Descartes is his radical materialism. In Hobbesian first philosophy the terms ‘substance’ and ‘body’ are convertible, which is to say that every material body is a substance and every substance is a material body.<sup>15</sup> Thus, where Aristotelianism had postulated an essentially non-material, intellectual faculty of the human soul and Descartes had argued for a radical metaphysical distinction between mind and matter, Hobbes’ point of departure is the claim that the mind is nothing more than a system of motions transmitted through the sensory apparatus.<sup>16</sup> Thus conceived, human beings are simply complex machines and there is no point in positing an immaterial realm of thought, cognition, or reason.

An almost immediate consequence of this strongly materialist programme is Hobbes’ embrace of a thoroughgoing nominalism about language, logic, and reasoning. Philosophers in the Aristotelian tradition held that the power of the intellect to abstract from particulars and frame general concepts applicable to (p. 381) anything was evidence of an essentially immaterial mental faculty. Likewise, Descartes had argued that the intellective powers of the rational soul ‘could not possibly be drawn from the potentiality of matter’ (*Discourse* 6; AT VI: 59; CSM 1: 141), and he famously argued that the human capacity to understand language was firm evidence of an immaterial mental faculty that distinguished humans from brute beasts. Hobbes took it upon himself to argue that the cognitive, linguistic, and intellectual abilities that others had attributed to an immaterial mind could be accounted for within the confines of his austere materialism. Towards that end, he insisted on the empiricist principle that all concepts arise from sense experience, or as he put it ‘[t]he Originall of [all ideas] is that which we call SENSE (For there is no conception in a mans mind, which hath not at first, totally, or by parts, been begotten upon the organs of Sense). The rest are derived from that originall’ (*Lev.* ch. 1: 13; EW 3: 2).

To account for language and reasoning without assuming the existence of non-sensory pure concepts of the intellect, Hobbes developed a theory of language that takes the primary linguistic activity to be the imposition of names.<sup>17</sup> Names, in Hobbes’ scheme, are simply material notes or sounds assigned by speakers and can be either proper or general: proper names are ‘singular to one onley thing’, while general names are ‘Common to many things’ (*Lev.* ch. 4: 26; EW 3: 21). This sets the stage for Hobbes’ nominalistic pronouncement that there is ‘nothing in the world Universall but Names; for the things named, are every one of them Individuall and Singular’ (*Lev.* ch. 4: 26; EW 3: 22). Thus, where others had taken abstract

names such as ‘man’ or ‘triangle’ to signify abstract concepts in the understanding, Hobbes takes them to signify indifferently any man, or any triangle. Hobbes’ account of reasoning builds on this approach to names by characterizing reasoning as a sort of mental arithmetic involving the adding and subtracting of mental contents: ‘Reason ... is nothing but *Reckoning* (that is, Adding and Subtracting) of the Consequences of generall names agreed upon’ (*Lev.* ch. 5: 32; EW 3: 30).

Hobbes applied his nominalistic programme to the science of logic in his 1655 work *De corpore*, whose first section bears the title ‘Logic’ and is devoted to his account of language and reasoning. Where the Aristotelian approach to logic and language had drawn metaphysical conclusions about the nature of ‘predicables’ or the categories of being, Hobbes insisted that the task of logic was to codify valid forms of the syllogism, a syllogism being understood as ‘a speech consisting of three Propositions, from two of which the third followes’ (Hobbes 1656a: 33; EW 1: 44). Likewise, where Descartes had taken reasoning to involve a purely intellectual grasp of abstract concepts and their interconnections, Hobbes replied in the third set of *Objections* to the *Meditations* that ‘reasoning is simply the joining together and concatenation of names or appellations by means of the verb “is”’, with the (p. 382) result that ‘by reasoning we conclude nothing about the nature of things, but only about their appellations; that is, whether or not we are combining the names of things in accordance with the conventions we have established by arbitrary choice concerning their significations’ (OL 5: 257; CSM 2: 125). From this, Hobbes reached a conclusion that combines nominalism with his characteristic materialism: ‘reasoning will depend on names, names on the imagination, and imagination will depend (as I believe it does) on the motions of our bodily organs; and so the mind will be nothing more than motion in various parts of an organic body’ (OL 5: 257–8; CSM 2: 125–6).

The strong nominalism in Hobbes’ account of demonstration might make it seem as if he regarded demonstrative reasoning as nothing more than a purely formal exercise in arranging terms into syllogisms, and this impression is strengthened by his remark to Descartes that reasoning can tell us ‘nothing about the nature of things’ but only about how we combine names. Nevertheless, Hobbes also held that demonstrative knowledge must be grounded in definitions that express the causes of things. As he put it in his treatise *On the Principles and Reasoning of the Geometers*: ‘[A]ll demonstrations are flawed, unless they are scientific, and unless they proceed from causes, they are not scientific’ (Hobbes 1666: 12; OL 4: 421). In fact, Hobbes distinguished between two kinds of definitions: stipulative definitions that tell us only how a term is to be used, and generative definitions that detail how something is produced by assigning its cause. Both are necessary to any language, but true demonstration depends on generative definitions, since ‘where there is place for Demonstration, if the first Principles, that is to say, the Definitions contain not the Generation of the Subject; there can be nothing demonstrated as it ought to be’ (Hobbes 1656b: sig. A2<sup>v</sup>; EW 7: 184).

This approach to demonstration led Hobbes to deny the traditional distinction between demonstrations τοῦ ὅτι and τοῦ διότι. Traditionally, a τοῦ ὅτι demonstration shows merely that something is the case, while a τοῦ διότι demonstration proceeds from causes to establish why the thing must be so. In the course of his mathematical controversy with John Wallis Hobbes complained that his opponent had mistaken the case by speaking of a τοῦ ὅτι demonstration, when in fact the only kind of demonstration must be τοῦ διότι

I was wishing that Wallis had defined what this demonstration τοῦ ὅτι is. For a demonstration τοῦ διότι is when someone shows by what cause a subject has such an affection. And so because every demonstration is scientific, and to know that such an affection is in the subject comes from cognition of the cause that necessarily produces that affection, there can be no demonstration other than the τοῦ διότι. He rightly says that which is called τοῦ ὅτι is not a proper [κυρίως] demonstration, that is, it is not a demonstration at all. For in the speech of mathematicians, ‘not to be’ and ‘not to be properly’ are the same thing. (Hobbes 1660: 24; OL 4: 38)

(p. 383) This leads Hobbes to a surprisingly Aristotelian conclusion: ‘if in every demonstration they say *that* something is true, or *that* it is false, how is it that one demonstration is *that* and another *because*? We don’t even know that something is so unless we know *because of what* it is so, in keeping with what we are accustomed to say with the Aristotelians “to know is to know through causes”’ (Hobbes 1660: 27; OL 4: 40).

## 16.5 The Cambridge Platonists

The philosophy of Hobbes was anathema to many seventeenth-century British thinkers and none more so than the so-called Cambridge Platonists—a group of philosophers associated with the University of Cambridge, whose most notable members were Henry More (1614–1687), Ralph Cudworth (1617–1689), Benjamin Whichcote (1609–1683), and Nathaniel Culverwell (1619–1651).<sup>18</sup> It would be a mistake to see all of the figures in this group as holding to a strict ‘party line’ in all aspects of philosophy, but there are some very significant points of agreement that justify treating them together. The group’s fundamental orientation was theological, and their primary shared objective was to show that faith and reason were fully compatible. Rejecting the scholastic-Aristotelian philosophy as outmoded and intellectually bankrupt, the Cambridge Platonists sought to reconcile the ‘perennial philosophy’ of Plato and neo-Platonism with the ‘new philosophy’ of nature advanced by Galileo and Descartes. Yet where Descartes, Galileo, or Hobbes emphasized the advantages of mechanism over the traditional Aristotelian science, the Cambridge Platonists continually harped on the limitations of a purely mechanistic science and argued that spirit is the fundamental causal principle in nature.<sup>19</sup> Hobbes was a particular *bête noir* for the Cambridge Platonists, and much of the focus of the group’s philosophical efforts was devoted to showing that abandoning Aristotelianism in favour of the ‘new philosophy’ did not entail an acceptance of Hobbes’ materialism, nominalism, or theologically dangerous views.

The Cambridge Platonists embraced an account of logic and demonstration that has clear affinities with Cartesianism, although there are also important differences. By far the best statement of the Cambridge Platonist approach to the subject is Culverwell’s *Elegant and Learned Discourse of the Light of Nature*, published posthumously in 1652. Culverwell outlined an account of knowledge in which the (p. 384) ‘light of nature’ or ‘candle of the Lord’ illuminates the mind and secures knowledge by presenting matters to us in a way that guarantees that the rational soul is compelled to grasp the truth. Just as a normally sighted person looking at a tree in the full light of day cannot help but see it in all its leafy green splendour, a properly functioning intellect will infallibly discern important metaphysical truths. As Culverwell states the case, ‘God hath breathed into all the sons of men Reasonable souls which may serve as so many Candles to enlighten and direct them in the searching out their Creatour, in the discovering of other inferiour beings, and themselves also’ (Culverwell 1652: 11). This epistemology is very much in the Cartesian mould in its reliance on an ‘innatist’ theory of mental contents: the Platonists insisted that certain concepts are innately present in the mind, and the process we call learning is really nothing more than a recollection of these innate concepts, or a ‘clarifying’ and ‘refining’ of previously given mental contents.

A significant difference between the Cambridge Platonists and the Cartesians is over the role of logic and the extent of what can be demonstrated. Where Descartes had viewed logic with some suspicion and complained that it could never lead to new truths, Culverwell characterized it as ‘nothing else but the just advancement of reason, an Art of Ripening and mellowing reason, an art of Clarifying and refining of the minde’ (Culverwell 1652: 142). Logic, thus conceived, is a tool to be used for directing the ‘light of nature’ towards consequences that follow from the innate concepts stored in the mind.

Further, where Cartesian theory held that demonstrative knowledge of God’s existence could be derived by an immediate intuitive inference from the (innate) concept of God, Culverwell and the other Cambridge Platonists held that the divine essence was not something graspable by demonstration. Instead, the ‘light of nature’ reliably informs us of the existence of God by a ‘beatifical vision’ that is open to all. In Culverwell’s words:

Nor yet is the divine essence seen in a way of demonstration, for then only a Philosopher should see his face, such only as had skil in Metaphysicks, who yet may be in misery for all that, for demonstrations are no beatifical visions. The damned spirits can demonstrate a Deity, and yet they are perpetually banisht from his face: there can be no demonstration of him *à priori*, for he is the first cause, and all demonstrations fetcht from such effects as flow from him, they do only shew you that he is, they do not open and display the divine essence, for they are not *effectus adaequantes virtutem causae* [effects proportionate to the power of the cause]. (Culverwell 1652: 211–12)

The scope of demonstrative knowledge, in this scheme, concerns those things of which we have fully adequate (innate) concepts, and demonstrations proceed by using logic to clarify and sharpen these concepts. According to the Platonists, we possess, for example, the innate concept of a triangle that expresses the essence of that figure; by focusing the light of nature on this concept we can derive consequences that follow from it, showing that the largest angle in a triangle subtends the (p. 385) largest side, and other such consequences. This approach differs from the traditional Aristotelian account of logic by paying essentially no attention to familiar topics such as the classification of syllogisms or reflections on the nature of the predicables. Instead, the real work of inference and demonstration is done by the 'light of nature' and its immediate grasp of truths and inferential connections. The result is that the Cambridge Platonists' account of logic and demonstrative knowledge appears as a variation on Cartesian themes, but with an admixture of the ancient Platonic and neo-Platonic doctrine of divine illumination.

## 16.6 Locke and Demonstrative Knowledge

The philosophy of logic and demonstrative knowledge in John Locke's *Essay concerning Human Understanding* brings together almost all of the themes we have seen in earlier writers on the subject. Locke was familiar with the traditional Aristotelian logic of the syllogism, and a good deal of his discussion of concepts like substance and essence shows the influence of the Aristotelian model. But Locke also shared the suspicion of logic (or at least the traditional logic of the syllogism) that we have seen in Bacon and Descartes. Locke agreed with Hobbes in accepting the empiricist principle that all concepts in the understanding have their origin in experience. This clearly set him against the views of the Cartesians and Cambridge Platonists, who emphasized the role of innate concepts in demonstrative knowledge. But Locke also rejected Hobbes' materialistic account of the mind and its associated nominalism, opting instead to see all logic and demonstration as generated by a process of abstraction, so that demonstrative knowledge is ultimately conversant about abstract ideas. An overview of these aspects of Locke's philosophy will complete this account of logic and demonstration in seventeenth-century British philosophy.

Locke was exposed to the traditional Aristotelian treatment of logic in his student days at Oxford, and his writings reveal him to have been quite familiar with the range of topics that Aristotelians normally discussed under the rubric of logic. In his account of the concept of substance, for example, Locke characterized the idea of 'substance in general' as a confused idea of an unknown 'substratum' that underlies or supports properties. When asked to elaborate on the seemingly sceptical consequences of this view, Locke explained to Bishop Stillingfleet in correspondence that this characterization of substance 'is the best I can hitherto find, either in my own thoughts, or in the books of logicians', and he went on to mention the logics of Burgersdijk and Sanderson as sources (Locke 1823, 4: 8, 449). This much shows his engagement with the accounts of predication and the (p. 386) categories traditionally discussed in logic texts, as well as his readiness to adopt such a framework.

Likewise, Locke's account of real and nominal essences in Book III of the *Essay* is phrased in terms familiar from logic texts in the Aristotelian tradition.<sup>20</sup> The real essence of a thing is 'the very being of any thing, whereby it is, what it is', but

The Learning and Disputes of the Schools, having been much busied about *Genus* and *Species*, the Word *Essence* has almost lost its primary signification; and instead of the real Constitution of things, has been almost wholly applied to the artificial Constitution of *Genus* and *Species*. (*Essay* III. iii. 15)

Locke here distances himself from the account of genus and species found in Aristotelian discussions of the categories, arguing instead that the 'nominal essence' of a thing is simply that collection of properties we use to sort objects into kinds, without concern for the ultimate 'inner nature' of the thing that makes it what it is. Yet, even if he had reservations about the Aristotelian approach, Locke was more than willing to engage in lengthy discussion of the concept of essence as it was understood in traditional treatments of logic.

Although Locke was familiar with the mingling of semantic, ontological, and linguistic topics that were part of Scholastic treatments of logic and saw some merit in this approach, he certainly did not see the theory of the syllogism as offering anything of great value. His reservations here are very much in step with those of Bacon and Descartes. Locke complained that ‘If we will observe the Actings of our own Minds, we shall find, that we reason best and clearest, when we only observe the connexion of the Proofs, without reducing our Thoughts to any Rule of Syllogism’ (*Essay* IV. xvii. 4). And, echoing the familiar objection that the syllogism is useless for discovering new knowledge, Locke insisted that it ‘*fails our Reason in that part, which if not its highest Perfection, is yet certainly its hardest Task, and that which we most need its help in; and that is the finding out of Proofs, and making new Discoveries*’ (*Essay* IV. xvii. 6). Indeed, Locke’s concerns with logic and demonstration were epistemologically driven, and for the most part he addressed issues in the subject primarily in so far as logic could be something useful to promote knowledge.<sup>21</sup>

Although he thought that the syllogism was of no use in advancing knowledge, Locke did believe that demonstrative knowledge was possible. He defined knowledge generally as the ‘*perception of the connexion and agreement, or disagreement and repugnancy of any of our Ideas*’ (*Essay* IV. i. 2), and he distinguished two degrees (p. 387) of certain knowledge: intuitive and demonstrative. For instance, we know intuitively that red is not blue by an immediate non-inferential apprehension of the difference between the ideas of red and blue; likewise, we have intuitive knowledge that the whole is greater than the (proper) part because our intuitive grasp of the ideas conveyed by the terms ‘whole’ and ‘part’. As we have seen, this is the sort of intuitive knowledge traditionally granted to first principles of any science. Demonstrative knowledge, by contrast, involves a perception of agreement or disagreement among ideas that is mediated through other ideas by way of a logical demonstration. To take the stock example of demonstrative knowledge, in order to know that the interior angles of any triangle sum to two right angles we must construct a proof that links the idea of a triangle’s interior angles to the idea of two right angles by way of intermediate geometric ideas. In Locke’s words:

Those intervening *Ideas*, which serve to shew the Agreement of any two others, are called *Proofs*; and where the Agreement or Disagreement is by this means plainly and clearly perceived, it is called *Demonstration*, it being *shewn* to the Understanding, and the Mind made see that it is so. (*Essay* IV. ii. 3)

Thus stated, the ideal of demonstrative knowledge differs minimally from the account offered by Cartesians or the Cambridge Platonists.<sup>22</sup> To know demonstratively is to begin with intuitively grasped concepts (or ‘ideas’) and to proceed by intuitively clear inferential steps from these ideas to a conclusion, mediated where necessary by intervening ideas that are also clear.

The difference between Locke and Descartes (or, for that matter, the Cambridge Platonists) is in the origin of the ideas on which demonstration is founded. Locke famously denied the doctrine of innate ideas and devoted the first book of the *Essay* to a number of arguments designed to show that there could be no ‘innate notions’ and all ideas must ultimately derive from experience. Locke and Hobbes agree on this point, but Locke had an alternative account of the nature of demonstration. Hobbes’ nominalism led him to claim that there is ‘nothing in the world Universall but Names; for the things named, are every one of them Individuall and Singular’ (*Lev.* ch. 4: 26; EW 3: 21). For Hobbes, the signification of a universal name is simply one or another of the individuals grouped together under that name:

One Universall name is imposed on many things, for their similitude in some quality, or other accident: And whereas a Proper Name bringeth to mind one thing onely; Universals recall any one of those many. (*Lev.* ch. 4: 26; EW 3: 21).

Locke, by contrast, held that general terms signify abstract ideas, formed by the mind’s separating off of various individuating features of particulars. In his words:

(p. 388) For since all things that exist are only particulars, how come we by general Terms, or where find we those general Natures they are supposed to stand for? Words become general, by being made the signs of general *Ideas*: and *Ideas* become general, by separating from them the circumstances of Time, and Place, and any other

*Ideas*, that may determine them to this or that particular Existence. By this way of abstraction they are made capable of representing more Individuals than one; each of which, having in it a conformity to that abstract *Idea*, is (as we call it) of that sort. (*Essay* III. iii. 6)

The result is that, where Hobbes held that logic and demonstration involved the ‘addition’ and ‘subtraction’ of names treated in accord with purely formal rules for their manipulation, Locke took demonstration to require the framing of the appropriate abstract ideas and then drawing consequences from them. We can thus see Locke as upholding an account of logic and demonstration that seeks to steer something of a middle course between the extreme nominalism of Hobbes and the nativism of Descartes and the Platonists. The true task of demonstration, as Locke would have it, involves the formation of the appropriate abstract ideas, from which consequences can be deductively established by means of logic. But such ideas must ultimately come from experience, albeit experience that has been supplemented by the mind’s capacity for abstraction and concept formation.

## 16.7 Conclusion

Theorizing about logic and demonstrative knowledge in seventeenth-century Britain followed an arc familiar from other branches of philosophy such as metaphysics or the philosophy of science, namely the gradual waning of the Aristotelian tradition and its eclipse by a variety of competing systems. The early part of the century was dominated by the traditional learning of ‘the schools’, with the result that Aristotelian and Scholastic treatments of logic held sway. As Aristotelian views came under pressure from a number of sources, British philosophy saw the introduction of alternative conceptions of logic and demonstration. Bacon’s hostility towards traditional logic and his project for an entirely new method of inductions amounted to a wholesale rejection of the traditional approach. Descartes and the Cartesians shared Bacon’s reservations about the syllogism as well as his emphasis on a method of discovery, and the introduction of Cartesian themes in British philosophy led to a significant reorientation of thinking on logic. Hobbes’ radical materialism and its associated nominalism was in many respects the most radical break with the tradition, but even Hobbes retained some aspects of the Aristotelian approach, as in his requirement that all true demonstrations proceed from causes. The Cambridge Platonists’ emphasis on the ‘light of Nature’ (p. 389) as a source of demonstrative certainty was yet another departure from the Aristotelian tradition and one that marked out nearly a polar opposite from the philosophy of Hobbes. In the latter stages of the seventeenth century, Locke’s account of logic and demonstration appeared as something of an eclectic approach, combining aspects of the traditional Aristotelian approach with the empiricism of Hobbes and the Cartesian emphasis on intuition as a source of the certainty that underlies demonstration.

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## Notes:

(1) See Nuchelmans 1998a for an overview of seventeenth-century discussions of logic.

(2) The mood of a syllogism is determined by the quantificational forms of its premises and conclusion (universal affirmative,

universal negative, particular affirmative, and particular negative). The figure of a categorical syllogism is determined by the subject/predicate position of the middle term.

(3) The predicables are the fundamental relations that may hold between predicate and subject; these were traditionally listed as: definition, genus, property, difference, and accident.

(4) The Aristotelian categories are the kinds of things that may be subject of predication or affirmation; these were usually taken to include: substance, quantity, quality, relation, place, time, position, state, action, and affection.

(5) This is the distinction between demonstrations that merely establish that something is the case (τοῦ ὅτι) and those which assign a cause to explain why something must be so (τοῦ διότι). In Latin the distinction was expressed as that between *demonstratio quod est* and *demonstratio propter quid*, or in English as ‘demonstration of the fact’ and ‘demonstration of the reasoned fact’.

(6) On Barrow’s veneration for the ancients in the context of early modern mathematics and science, see Feingold 1990.

(7) This is not to say that there were no reservations about the status of some Euclidean principles. The notorious parallel postulate (postulate 5 in the first book of Euclid’s *Elements*) and the definition of composite ratios (definition 5 in the sixth book) were thought to be either derivable from other principles or in need of explication. Henry Savile’s *Prælectiones Tresdecim in Principium Elementorum Euclidis* took these to be ‘two flaws or blemishes on the otherwise most beautiful body of geometry’, and he proposed that they should be proved from more basic principles (Savile 1621: 140–1).

(8) Locke, for instance, declared ‘I am bold to think, that *Morality is capable of Demonstration*, as well as Mathematicks’ (*Essay* III. xi. 16), and Hobbes notoriously boasted of having founded a truly demonstrative science of politics.

(9) On seventeenth-century conceptions of method, see Dear 1998.

(10) For Bacon’s relationship to the Aristotelian tradition and his proposal for a new method, see Gaukroger 2001, especially ch. 5.

(11) These include: accept only what is incontrovertibly evident, resolve difficulties into their constituent parts, order enquiry to proceed from simple to complex problems, and make all enumerations complete (AT VI: 18–19; CSM 1: 120).

(12) Gaukroger 1989 stresses the role of the ‘intuitive grasp’ of consequences in Descartes’ approach to inference, contrasting it with the ‘discursive’ model found in the Aristotelian syllogism.

(13) Ariew 2006 details the spread of Cartesian treatises on logic in the seventeenth century.

(14) For an overview of Hobbes’ views on language and logic see Martinich 2005, ch. 5. Hanson 1990 is a detailed account of Hobbes’ views on logic and demonstrative knowledge.

(15) As Hobbes explains in chapter 34 of *Leviathan*: ‘*Substance and Body*, signifie the same thing; and therefore *Substance incorporeall* are words, which when they are joined together, destroy one another, as if a man should say, an *Incorporeall Body*’ (*Lev.* ch. 34: 270; EW 3: 380).

(16) See Pettit 2008, ch. 1 and Martinich 2005, ch. 2 for summaries of Hobbes’ account of the nature of mind.

(17) See Martinich 2005, ch. 5 and Pettit 2008, chs 2–3 on Hobbes’ account of language and reasoning.

(18) For an overview of the philosophy of the Cambridge Platonists see Hutton 2002 and the collection in Rogers, Vienne, and Zarka 1997.

(19) See Gabbey 1982 on More and the other Cambridge Platonists’ relationship to the Cartesian philosophy.

(20) See Atherton 2007 for Locke's account of real and nominal essences.

(21) Yolton (1977: 5–6) notes the influence of Locke's epistemological and psychological approach to logic: 'Developments in logic, an area that Locke is usually thought to have despised, ... were also picked up and extended by Locke. These logics, and those that followed and for the most part copied Locke in eighteenth-century Britain ... were epistemic logics concerned with the natural history of the understanding'.

(22) It is interesting to note that Locke uses the image of the understanding as a 'candle' in a passage that could easily have come from Culverwell: 'The Candle, that is set up in us, shines bright enough for all our Purposes' (*Essay* I. i. 5).

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## Will and Motivation

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## Abstract and Keywords

The chapter, which examines the views of seventeenth-century British philosophers on the notion of will and motivation, explains the answers of philosophers on questions concerning the relation among will, freedom of action, motivation, and causal determination. These philosophers include John Bramhall, Thomas Hobbes, Ralph Cudworth, and John Locke. The chapter concludes that the history of British thought on the issue of will and motivation is complex one.

Keywords: will, motivation, British philosophers, freedom of action, causal determination, John Bramhall, Thomas Hobbes, Ralph Cudworth, John Locke

It is a striking fact that the world of individuals is divided into those that can, and those that cannot, move themselves. The autographed baseball on my desk sits there, and will continue to do so unless someone picks it up. If it is thrown, it will move, but not under its own power. By contrast, human beings are all capable of initiating, and not merely undergoing, bodily motion. But what is it about humans that accounts for the fact that they can move themselves? One simple answer to this question is that, unlike baseballs, humans have a will, that the bodily motions that they themselves initiate are voluntary. It is also a striking fact that we often take human beings to be responsible, indeed praiseworthy and blameworthy, for their actions. Moreover, it is commonly supposed that responsibility, praise, and blame attach to free rather than to unfree actions.

What we are inclined to say about these matters raises important philosophical questions with which British philosophers of the seventeenth century struggled valiantly. Which bodily motions are voluntary, and which involuntary? Does voluntariness require deliberation in advance of action? In particular, does voluntariness attach to habitual actions, actions performed under duress, or actions done in ignorance of the relevant circumstances? Are voluntary acts caused or uncaused? If caused, are they caused by our appetites, inclinations, or judgements about what is best? Or are they caused by some special non-appetitive, non-cognitive, act of will? Supposing the latter, are acts of will themselves caused or uncaused? If they are caused, are they caused by something purely internal to the agent (such as an (p. 394) appetite, judgement, or act of will), or are they caused by something external to the agent? Can actions be caused, indeed causally determined, and yet still be voluntary? If there are acts of will, does it make sense to attribute voluntariness to them? Is there such a condition as weakness of will (*akrasia*), wherein one chooses and performs a voluntary action, knowing or believing that it is worse than the alternatives? If not, why not? If so, how is *akrasia* possible?

Furthermore, are all voluntary acts free, and all free acts voluntary? Is freedom a property of an individual organism or of the organism's soul or principle of life? Does freedom come in degrees, or is it an all-or-nothing property? Supposing there are acts of will, and hence a power to will, does it make sense to think of this power as free? If so, do responsibility, praise, and blame attach to creatures with freedom of action only if these creatures also possess freedom of will? Is the causal

determination of an action or act of will inconsistent with its being free?

In this chapter, I describe the answers to these questions propounded and defended by representatives of four major schools of thought on these issues: John Bramhall, Thomas Hobbes, Ralph Cudworth, and John Locke. As we will see, Locke himself changed his mind on some important matters, the second and subsequent editions of the *Essay* differing considerably from the first. (We will call the author of the  $n$ th edition 'Locke <sub>$n$</sub> '.) On some important issues (such as weakness of will and compatibilism), Bramhall and Cudworth find themselves allied against Hobbes and Locke. On other important issues (such as the non-desiderative nature of the will), Locke<sub>2-5</sub> and Cudworth find themselves allied against Bramhall and Hobbes. And these are not the only theoretical fault lines. The story of the development of seventeenth-century British thought on issues related to the will and motivation is both complex and fascinating.

## 17.1 Bramhall

In 1640, shortly before the English Civil War, Thomas Hobbes fled to Paris, where he met regularly with his patron, William Cavendish, then Marquis of Newcastle. It was at Newcastle's home in 1645 that Hobbes met John Bramhall, then Bishop of Londonderry, Ireland. What most likely started as a dinner conversation on free will blossomed into a full-blown battle of books that consumed both participants until Bramhall published his *Castigations of Mr. Hobbes* in 1658.

Bramhall's views are not original, but they are representative of a particular variety of late scholastic thought on the nature of voluntariness and freedom that can be found in the works of Jacobus Arminius (a sixteenth-century Dutch protestant theologian, responsible for the Remonstrant offshoot of Calvinism) (p. 395) and Luis de Molina (a sixteenth-century Spanish Jesuit). In order to understand Arminianism and Molinism, it is necessary to begin with late scholastic hylomorphism. According to hylomorphism, every substance (i.e. every bearer of properties) is a combination of matter and substantial form. Matter persists through change, while substantial form makes a substance the particular kind of thing it is. All human beings are substances, and hence all human beings are hylomorphic composites, a combination of matter (the human body) and substantial form (the human soul). Although the human soul is simple and unitary in not having parts, it has faculties or powers of three basic types: vegetative, sensitive, and intellective (or rational). (The first it shares with plants and animals, the second it shares with animals only, and the third is unique to it.) The soul's faculties are individuated by their characteristic activities and by their objects. So, for example, the soul's power of sight is the power to see (= activity) colour (= object). Importantly, the soul has two kinds of conative powers, irrational appetite and rational appetite. Irrational appetite is the power to desire sensible things that bring about sensible pleasure (such as food, drink, and sex). Rational appetite, which is identified with the will, is the power to desire the apparent good, where the apparent good is what the soul judges to be good. Everything that is judged to be good is either judged to be good as an end or judged to be good as a means to an end. The will, then, is the power to desire both apparently good ends and also apparently good means to apparently good ends. When the soul judges that something is good as an end or good as a means, it exercises the faculty of intellect (reason, understanding). The will, then, is the power of *rational* appetite inasmuch as it is the power to desire what the soul judges good via the exercise of reason.

Anything that has the power to do A can actualize that power by doing A. Thus, anything that has the power of sight can actualize that power by seeing (something), and anything that has a will can actualize that power by willing, that is, by desiring an apparent good. Because there are two fundamentally different kinds of apparent goods (ends and means), there are two fundamentally different kinds of willing. According to the late scholastic picture, the actualization of the power to desire something as an apparently good *end* is *simple willing*. By contrast, the actualization of the power to desire something as an apparently good *means* involves desiring something that is judged to be better than all other alternative means, and hence counts as *choosing* among alternative means. No choosing among alternatives is involved in any case of simple willing, and no desire for an end is involved in choice.

Each actualization of a power involves a double act, first of exercise, and second of specification. In the case of simple

willing, there is, first, the decision to will or not to will, and, second, the decision to will this or that apparently good end. Notice here that it is important to Bramhall that the soul (even the will) have the power *not* to will, that is, the power to *suspend willing*, even when all the soul's (p. 396) desires and considered judgement point in a single direction (call this 'The Doctrine of Suspension').<sup>1</sup> In the case of choice, there is, first, the decision to choose or not to choose, and, second, the decision to choose this or that apparently good means (to a given apparently good end). Choice is always preceded by deliberation, which is 'an enquiry made by reason, whether this or that, definitely considered, be a good and fit means, or, indefinitely, what are good and fit means to be chosen for attaining some wished end' (EW 5: 358). By contrast, simple willing is not preceded by deliberation, for 'deliberation is of the means, not of the end' (EW 5: 393).

Among scholastics, there was a lively debate about what it is that moves (and hence determines) the will to actualization. All scholastics were agreed that the will (or, better, the soul) moves the will with respect to exercise. It is, on their view, entirely up to the soul whether it will will or not, choose or not. But there was disagreement over whether, with respect to specification, the will is moved solely and entirely by the last judgement of the understanding regarding the good (end or means): intellectualists (including Thomas Aquinas and his followers) held that it is, while voluntarists (including Arminians and Molinists, among them Bramhall) held that it is not. Interestingly, one's position in this debate determines one's position on the question of the possibility of weakness of will. For if, as the Thomists hold, the will is determined with respect to specification by the last judgement of the understanding regarding the good, then it is not possible for the soul to aim at the bad (or the worse) knowingly, and hence *akrasia* in the domain of specification is impossible. But if, as the Arminians and Molinists hold, the will is *not* determined with respect to specification by the last judgement of the understanding regarding the good (but is rather determined by *the soul*, as it is with respect to *exercise*), then it *is* possible for the soul to aim at the bad (or the worse) knowingly, and hence *akrasia* in the domain of specification is possible.

These disagreements were driven in large part by a tension at the heart of the scholastic conception of the will. On the one hand, following Aristotle, it is tempting to conceive of the will as the power of rational appetite. On the other, again following Aristotle, it is tempting to recognize the possibility of weakness of will. But these two conceptions do not sit comfortably with each other. If the will is the power of rational appetite, then it is determined to follow the greatest perceived good. But if *akrasia* is possible, then the will can choose the apparent bad (or the apparently worse), and hence is not determined to follow the greatest perceived good. Molinists and Arminians, such as Bramhall, are stuck with the tension. Thomists reduce the tension by giving up on the possibility of *akrasia*, at least in the case of specification of the power of choice. As we will see, Hobbes, Cudworth, and Locke find interestingly different ways of avoiding the tension altogether.

(p. 397) So much for the scholastic conception of the will. With regard to the relation between will and act, the scholastics provided a fourfold typology of human action, helpfully, but also somewhat misleadingly, summarized by Bramhall in the following passage:

Some acts proceed wholly from an extrinsical cause; as the throwing of a stone upwards, a rape, or the drawing of a Christian by plain force to the idol's temple; these are called violent acts. Secondly, some proceed from an intrinsical cause, but without any manner of knowledge of the end, as the falling of a stone downwards; these are called natural acts. Thirdly, some proceed from an internal principle, with an imperfect knowledge of the end, where there is an appetite to the object, but no deliberation nor election; as the acts of fools, children, beasts, and the inconsiderate acts of men of judgment. These are called voluntary or spontaneous acts. Fourthly, some proceed from an intrinsical cause, with a more perfect knowledge of the end, which are elected upon deliberation. These are called free acts. (EW 5: 84)

Bramhall here suggests that voluntary (or spontaneous) acts are those that proceed from rational desire for an end that is only imperfectly known, without choice or deliberation among alternative means for achieving the end. This is very close, but not in fact identical to, his considered view. For, as he says elsewhere (in the same section): 'I distinguish between free acts and voluntary acts. The former are always deliberate, the latter may be indeliberate; all free acts are voluntary, but all voluntary acts are not free [i.e. not all voluntary acts are free]' (EW 5: 81–2). Strictly speaking, then, voluntary or

spontaneous actions *may*, though they need not, be chosen upon deliberation, whereas free acts *must* be chosen upon deliberation. The most important difference between free acts and merely-voluntary-but-unfree acts is that the former require more perfect, while the latter are based on less perfect, knowledge of the end.<sup>2</sup>

According to Bramhall, there are two main kinds of freedom or liberty, freedom to act and freedom to will. Freedom of action is a property of a human being; freedom to will is a property of the will (and so, indirectly, of the soul). A human being H is free with respect to action A if and only if H has the power to do A or not A, which of the two H chooses. Freedom of action therefore requires the ability to do otherwise. Freedom to will comes in two varieties, depending on whether it concerns simple willing (liberty of exercise) or choice (liberty of specification). A soul S is free with respect to a simple willing W (or choice C) if and only if when all things are present which are needful to produce W (or C), S can nevertheless not produce W (or C) (see EW 5: 385).

(p. 398) As the scholastics understood ‘ability’, determinism (the thesis that every event proceeds from extrinsic necessary causes that necessitate it, such that it is impossible for the event not to have occurred) is logically incompatible with both freedom of action and freedom to will, for determinism makes it impossible for a human being to have done, or for a soul to have willed or chosen, otherwise. The scholastics, including Bramhall, were therefore incompatibilists. In respect of the freedom to will, all scholastics were agreed that a human soul’s simple willings are determined by the will, and not by any necessary causes extrinsic to the will. On their view, then, every human being is free with respect to any act of simple willing. But, as we have seen, Thomists and Molinists/Arminians disagreed about whether *choices* are determined by the last dictate of the understanding, the former holding that they are, the latter holding that they are not. Consequently, Molinists and Arminians (such as Bramhall) affirmed, while Thomists denied, that human beings have freedom with respect to any act of choice. For Bramhall, then, human souls have both liberty of exercise and liberty of specification.<sup>3</sup> And given his incompatibilism, Bramhall is therefore committed to the falsity of determinism.

## 17.2 Hobbes

Apart from agreeing on the nature of freedom of action, Hobbes and Bramhall disagree about almost everything else relevant to issues involving the will.<sup>4</sup> The main reason for this is that Hobbes is a devotee of the new anti-scholastic, anti-hylomorphic mechanistic science. On this view, the explanation of natural phenomena is not based, as it is on the scholastic picture, on knowledge of substantial forms, but rather on knowledge of the size, shape, weight, hardness, and motion of material corpuscles. Indeed, Hobbes’ metaphysics does away with the hylomorphic conception of substance altogether. Human beings, on Hobbes’ picture, are nothing but specially organized bundles of material corpuscles. Hobbes makes room for the soul, but thinks of it as a material thing, rather than as the form of the human being. Hobbes also makes room for sensation, imagination, appetite, and reason, but conceives all of these operations of the soul as various types of corpuscular motions. Sense is ‘motion in the organs and interior parts of man’s body, caused by the action of the things we see, hear, &c.’, imagination ‘is but the relics of [sense]’, and appetites, being the imaginings ‘of *whither*, *which way*, and *what*’, are the (p. 399) ‘small beginnings of motion, within the body of man, before they appear in walking, speaking, striking, and other visible actions’ (EW 3: 38–9). Even ‘reason and understanding also are acts of the imagination, that is to say, they are imaginations’ (EW 5: 401; see also 5: 358).

Because appetites are ‘small beginnings of motion’, it makes no sense to distinguish, as Bramhall does, between rational and irrational appetites.<sup>5</sup> It follows that on the Hobbesian picture, the will cannot be identified either with the soul’s power of rational appetite or with individual rational appetites. To understand Hobbes’ conception of the will, one needs to understand his conception of deliberation. As Hobbes conceives it, deliberation is, generally speaking, ‘the considering of the good and evil sequels of the action to come’ (EW 5: 389), but more particularly, deliberation occurs ‘when in the mind of man appetites, and aversions, hopes and fears, concerning one and the same thing, arise alternately; and divers good and evil consequences of the doing, or omitting the thing propounded, come successively into our thoughts’ (EW 3: 47). This is a curiously passive conception of deliberation. For on Hobbes’ view deliberation consists not in a kind of goal-directed mental



activity (as it is on Bramhall's view), but rather in an alternating sequence of events that occur in the mind when the question arises as to which of various alternative courses of action should be taken.

The will, for Hobbes, is nothing but the power of appetite (EW 5: 93), and every act of willing (or volition) is nothing but 'the last act of our deliberation' (EW 5: 389), that is, 'the last appetite, or aversion [in deliberation], immediately adhering to the action, or to the omission thereof' (EW 3: 48). It follows from this that Hobbes' volitions are all particular motions in the human body (indeed, in the heart; see EW 3: 2). And it also follows that there is no distinction to be made, as on Bramhall's picture, between different acts of will (simple willings and choices) or between different actualizations of the power to will (exercise and specification).

As Hobbes sees it, what moves the will is whatever is causally responsible for the last appetite in the course of deliberation. But appetites are caused by things that are external to the agent, as delicious food causes an appetite or desire for it and a ferocious animal causes an aversion to it (EW 3: 39). It follows that the will is not *determined* by the last judgement of the understanding, but is rather *constituted by* an appetite for what the soul judges best all things considered. And it is the action (rather than the will) that immediately and necessarily follows the last judgement (see EW 5: 317). This picture, unlike Bramhall's, clearly leaves no room for the possibility of *akrasia*.<sup>6</sup> Thus Hobbes avoids the tension between the proposition (p. 400) that the will is the power of rational appetite and the proposition that *akrasia* is possible by simply denying both propositions.

Hobbes' official conception of voluntary action differs significantly from Bramhall's. According to Bramhall, voluntary (or spontaneous) acts are those that proceed from rational desire for an end that is only imperfectly known; and though all free acts are necessarily chosen upon deliberation, voluntary acts need not be deliberated upon before being performed. Hobbes, at least initially, disagrees, for he writes that 'voluntary presupposes some precedent deliberation, that is to say, some consideration and meditation of what is likely to follow, both upon the doing and abstaining from the action deliberated of' (EW 5: 79). In this, Hobbes writes, voluntariness is to be distinguished from spontaneity, which is properly defined as 'inconsiderate proceeding' (EW 5: 389). However, Hobbes also characterizes voluntary actions as 'those actions that follow immediately the last appetite', even those 'where there is only one appetite' (EW 5: 345). This definition is prompted by examples of voluntary action that are not preceded by any deliberation, either because there is no time for it—as when 'in sudden anger the action shall follow the thought of revenge, in sudden fear the thought of escape' (EW 5: 344)—or because, even though there is time for it, 'never anything appeared that could make [one] doubt of the consequence' (EW 5: 344–5)—as in the case of habitual actions, such as eating and walking, that are 'done without fore thought' (EW 5: 81).

Upbraided by Bramhall for having provided mutually inconsistent definitions of voluntariness (EW 5: 82, 346), Hobbes eventually abandons the official definition.<sup>7</sup> Hobbes writes that '*voluntary* presupposeth *deliberation*, when the judgment, whether the action be voluntary or not, is not in the actor, but in the judge', and more particularly, that 'the action of a man that is not a child, in public judgment how rash, inconsiderate, and sudden soever it be, it is to be taken for deliberation; because it is supposed, he ought to have considered and compared his intended action with the law; when, nevertheless, that sudden and indeliberate action was truly voluntary' (EW 5: 94). Hobbes' point is that although some voluntary actions (such as rash acts) were *not* chosen upon deliberation, a judge of those acts will, for purposes of the administration of justice, *suppose* that they were, on the grounds that the agent 'ought to have deliberated, and had time enough to deliberate whether the action were lawful or not' (EW 5: 350). Hobbes' understanding of voluntariness is therefore closer to Bramhall's than he would like to admit, for both (p. 401) philosophers make room for the possibility of indeliberate voluntariness. The main difference between them on this issue does not lie here, but rather lies on the epistemic front. For Hobbes affirms, while Bramhall denies, that voluntariness is compatible with ignorance of relevant features of the situation.

For Bramhall, a free human agent is one who has both freedom of action and freedom to will, both liberty of exercise and liberty of specification. As Hobbes sees it, there is and can be no more to freedom than freedom of action: 'It cannot be conceived that there is any liberty greater than for a man to do what he will, and to forbear what he will ... He that can do what he will, hath all liberty possible; and he that cannot, has none at all' (EW 5: 249–50). Hobbes' position is that the soul

has no freedom to will, a thesis that follows directly from his conception of volition. For the Hobbesian will is nothing but the power of appetite, and every volition is no more than the last appetite in the course of deliberation. So, as Hobbes sees it, freedom to will would have to consist in freedom to desire, which would itself have to consist in the ability to desire what one chooses to desire and the ability to forbear desiring what one chooses not to desire. But, Hobbes holds, it is nonsense to suppose that anyone should have these sorts of abilities. Human beings do not and cannot choose to desire, or not to desire, this or that.<sup>8</sup> It follows, despite Bramhall's insistence to the contrary, that human beings do not have the power to suspend willing, i.e. that the Doctrine of Suspension is false; for '*the will, and the willing, and the appetite is the same thing*' (EW 5: 295).<sup>9</sup> Indeed, Hobbes ridicules the very concepts of liberty of exercise and liberty of specification, calling the phrases that are supposed to express them but 'jargon, or that ... which the Scripture in the first chaos calleth *Tohu* and *Bohu* [that is, confusion and emptiness]' (EW 5: 63, 20).

But in what, according to Hobbes, does freedom of action consist? Hobbes' pronouncements on the issue, at least initially, appear to be mutually inconsistent. In some places, Hobbes characterizes freedom of action as involving a dual conditional ability. On this view, a human being H is free with respect to action A when and only when (i) H has the ability to do A if H wills to do A and (ii) H has the ability to forbear doing A if H wills to forbear doing A. For example, Hobbes writes that 'he is free to do a thing, that may do it if he have the will to do it, and may forbear if he have the will to forbear' (EW 5: 38), and that 'a *free agent*, is he that can (p. 402) do if he will and forbear if he will' (underlining added; EW 5: 389, 450).<sup>10</sup> In other places, Hobbes offers what appear to be completely different accounts of freedom of action. First, Hobbes writes that to say that one is free is 'to say he hath not made an end of deliberating' (EW 5: 363). Second, Hobbes says that '[l]iberty is the absence of all the impediments to action, that are not contained in the nature, and in the intrinsical quality of the agent' (EW 5: 367), that 'a *free man* is he that, in those things which by his strength and wit he is able to do, is not hindered to do what he has a will to' (EW 3: 196–7).

Does Hobbes mean these various formulations of freedom of action to be mutually equivalent? I believe so. First, it is reasonable to suppose that by 'X has the ability to [i.e. can] do A if X wills to do A', Hobbes means no more than 'there are no external impediments to X's doing A'. For it is reasonable to suppose that by 'X can do A', Hobbes means no more than 'there is nothing external to X to prevent X's doing A'; and Hobbes defines 'impediment or hinderance' as 'an opposition to endeavour' (EW 5: 352), and defines 'endeavour' as the genus of desire and aversion (EW 3: 39). So, as he sees it, to say that there are no external impediments to X's doing A is to say that there is nothing external to X to prevent X from carrying out his endeavour (i.e. his will) to do A. Second, Hobbes makes clear that if there are external impediments to X's doing A, then X has finished deliberating (for 'there are no impediments but to the action, whilst we are endeavouring to do it, which is not till we have done deliberating'; EW 5: 366–7), and hence that if X has not finished deliberating, then there are no external impediments to X's doing A, and hence X is free with respect to A.<sup>11</sup>

Given his conception of freedom as freedom of action, it is unsurprising that Hobbes (unlike Bramhall) is a compatibilist. As Hobbes sees it, it is possible for human actions to be causally determined (indeed, necessitated), even as humans are free to do as they will, for freedom is no more than the ability to do, and to forbear doing, as one wills. Indeed, Hobbes holds the radical position that this situation is not only *possible*, but also *actual*. For Hobbes believes that there are a priori reasons to accept determinism: first, that God (whose existence can be known a priori, and whose perfection guarantees his omniscience) foreknows all propositions about the future, and what God foreknows must come to pass (EW 5: 428–9); second, that 'whatsoever is produced, hath had a sufficient cause to produce it', that 'a sufficient cause [is] a necessary cause', and hence that everything (p. 403) that happens happens necessarily (EW 5: 380); and third, that it is necessary that *p* or *not-p*, and hence either it is necessary that *p* or it is necessary that *not-p* (EW 5: 406).<sup>12</sup>

## 17.3 Cudworth

Ralph Cudworth was the most influential proponent of a view that has come to be known as Cambridge Platonism. The moniker derives from the fact that Cudworth (along with his like-minded friend, Henry More) spent his entire professional

adult life at the University of Cambridge, defending doctrines of a broadly Platonic character. On the subject of will and motivation, Cudworth's Platonic sympathies provide him with a unique perspective on the matters debated by Bramhall and Hobbes, a perspective that almost certainly influenced the revisions to the *Essay* that Locke undertook towards the end of his life while a guest of Cudworth's daughter and accomplished philosopher in her own right, Damaris Masham.

Like Hobbes, Cudworth was unremittingly hostile to the scholastic conception of the human mind and its powers. But Cudworth's hostility did not derive from any sort of allegiance to mechanistic science, but rather from sympathy with Plato's tripartite conception of the soul. In the *Republic*, Plato (through his mouthpiece, Socrates) claims that the soul has three parts: Reason (the calculating part that considers consequences and aims at the best, whose function is to rule the whole soul), Spirit (the part responsible for anger, whose function is to assist reason in performing its function), and Appetite (the part responsible for desire, whose function is to seek pleasure). One of Plato's reasons for thinking that Reason differs from Appetite is that Reason can lead the soul to shun what Appetite leads the soul to embrace. Indeed, in a well-ordered soul, Reason rules and, with the help of Spirit, resists Appetite's attempts to fulfil its desires.

In Cudworth's system, the function of reason is taken over by the soul's hegemonic (*to hegemonikon*), which he identifies with the soul's 'power over itself, its exerting itself with more or less force and vigour in resisting [the] lower affections, or hindering the gratification of them' (EIM XI: 182). Although the hegemonic is responsible for the soul's volitions, Cudworth does not think of it as a kind of blind faculty of will, 'utterly devoid of all light, and perception, or understanding' (EIM IX: 177). Like Plato's reason, the hegemonic is capable of acquiring knowledge of the good and directing the soul to pursue it. Cudworth therefore differs from (p. 404) Bramhall and other scholastics in refusing to think of the will as rational desire, and differs from Hobbes in refusing to think of the will as the faculty of desire *simpliciter*: as he sees it, the hegemonic is not a desiderative faculty at all.

Like Bramhall, Cudworth allows for the possibility of weakness of will. As he says: 'a man's soul as hegemonical over itself ... may, upon slight considerations and immature deliberations ... choose and prefer that which is really worse before the better' (EIM X: 178–9). But whereas Bramhall's acceptance of weakness of will does not sit well with his identification of the will with the power of rational desire (see above), Cudworth's non-desiderative conception of the hegemonic enables him to avoid this tension altogether.

Given his acceptance of the possibility of weak-willed action, Cudworth is unsurprisingly hostile to scholastic intellectualism. For if, as intellectualists hold, the will always follows the last dictate of the understanding, and if the understanding, as Cudworth admits, is judge of apparent goodness and badness, then *akrasia* would be impossible. But Cudworth's hostility to intellectualism stems also from his resistance to determinism, the truth of which, on his view, would unacceptably rob all praise, blame, repentance, and punishment of any justification (EIM: 1).<sup>13</sup>

But if the understanding does not move the hegemonic, what does? Cudworth's answer is that the hegemonic is special in having the ability to move itself. In support of this claim, Cudworth offers the following argument. First, the hegemonic (and hence the soul whose ruling principle it is) is self-conscious, in that it can 'intend and exert itself' (EIM XIII: 185). And second, whatever is self-conscious is capable of self-motion: 'That which is thus conscious of itself, and reflexive upon itself, may also as well act upon itself, either as fortuitously determining its own activity or else as intending and exerting itself more or less in order to the promoting of its own good' (EIM XIX: 201). Against Hobbes' objections that (i) nothing is capable of moving itself and (ii) nothing can be both agent and patient (with respect to itself), Cudworth insists that Hobbes mistakenly applies 'that to all being whatsoever, which is the property of body only' (EIM XVIII: 199). For, Cudworth insists, the existence of corporeal motion requires the existence of an unmoved, self-moving mover, and hence is proof that self-motion is not only possible, but actual.<sup>14</sup>

Apart from exercising the Platonic function of resisting the lower affections, Cudworth's hegemonic also works to engage in and stop speculation and deliberation. This fact is one of which we have empirical knowledge, presumably by introspection:

(p. 405) we know, by certain experience, that speculation or deliberation about particular things is determined by

ourselves both as to objects and exercise; we can call it off from one thing, and employ it or set it a work upon another, and we can surcease, suspend, and stop the exercise of it (when we please) too, diverting ourselves into action. (EIM IX: 178)

Thus, Cudworth agrees with Bramhall, as against Hobbes, that the Doctrine of Suspension is true. Even if it has decided to act, the soul has the ability to keep itself from acting in order to engage in further deliberation; and then the soul can, whenever it pleases, halt any further deliberation and act in accordance with what appears to be the best. Indeed, Cudworth emphasizes the fact that the very point and function of the hegemonic's power of suspension is to achieve the good.<sup>15</sup>

It is the hegemonic's power of 'intending or exerting itself more or less in consideration and deliberation, in resisting the lower appetites that oppose it ... in self-recollection and attention, and vigilant circumspection, or standing upon our guard' (EIM X: 178) that Cudworth identifies with what he calls the '*liberum arbitrium* or freewill' (EIM XIV: 185). Like the incompatibilist Bramhall, and unlike the compatibilist Hobbes, Cudworth insists that true freedom involves 'freedom from necessity' (EIM XIII: 185), that such freedom requires the ability to do otherwise, and that the ability to do otherwise requires the power of self-determination that uniquely belongs to the soul's hegemonic. In addition to freedom of action, then, true freedom requires the freedom to will, to engage in and stop speculation and deliberation, as one pleases.

Cudworth's contribution to the debate about freedom and necessity thus consists in his attempt to frame a point of view that cuts across the lines of disagreement that separate Bramhall from Hobbes. On the one hand, like Hobbes, Cudworth jettisons Bramhall's scholastic assumptions, including the conception of the soul as unitary, as well as the conception of the will as rational desire. On the other hand, as against Hobbes, Cudworth embraces Bramhall's incompatibilism and his insistence that there is such a thing as free will (or freedom of will) distinct from freedom of action.

The main question for Cudworth, of course, is whether there is such a thing as the soul's hegemonic as he conceives of it. Part of Cudworth's hostility to the scholastic theory of mind derives from a Hobbesian disdain for treating the powers of the mind as homuncular agents. Echoing Hobbes' criticisms of Bramhall, Cudworth famously opines:

But this scholastic philosophy is manifestly absurd, and mere scholastic jargon. For to attribute the act of intellection and perception to the faculty of understanding, and acts of (p. 406) volition to the faculty of will, or to say that it is the understanding that understandeth, and the will that willeth—this is all one as if one should say that the faculty of walking walketh, and the faculty of speaking speaketh, or that the musical faculty playeth a lesson upon the lute, or sings this or that tune ... all this while it is really the man or soul that understands, and the man or soul that wills, as it is the man that walks and the man that speaks or talks, and the musician that plays a lesson on the lute. So that it is one and the same subsistent thing, one and the same soul that both understandeth and willeth, and the same agent only that acteth diversely. (EIM VII: 170–1)

In some places Cudworth is careful to suggest, consistently with this approach, that the hegemonic is nothing more than a power that the soul possesses.<sup>16</sup> But in other places, Cudworth treats the hegemonic as an agent within the soul that possesses this power.<sup>17</sup> And in yet other places Cudworth writes as if the hegemonic is the entire soul, considered in a certain way, namely as possessing this power.<sup>18</sup>

Cudworth's problem is that he is frankly pulled in two opposite directions. On the one hand, he cannot accept the scholastic hypostatization of the will. On the other hand, his Platonic conception of the soul encourages his treatment of the hegemonic (a counterpart of Plato's Reason) as an agent endowed with powers of its own. And this Platonic conception is reinforced by separate considerations related to the need to explain the soul's essential unity. As Cudworth sees it, the soul would be incapable of motion and action if it did not have a guiding principle controlling its various appetites and affections. Thus, for example, Cudworth writes:

I say there being so many wheels in this machine of our souls, unless they be all aptly knit and put together, so as to conspire into one, and unless there be some one thing presiding over them, intending itself more or less,

directing, and ordering, and giving the fiat for action, it could not go forwards in motion, but there must be a confusion and distraction in it, and we must needs be perpetually in puzzle.<sup>19</sup> (EIM XVI: 194)

(p. 407) There is therefore a fundamental and ineradicable tension at the heart of Cudworth's conception of the soul. And this tension makes it impossible for him to provide a fully satisfactory philosophical solution to the problem of free will.

## 17.4 Locke

Locke ventured into the philosophical minefield of will, motivation, and freedom in Chapter 21 ('Of Power') of the first edition of the *Essay concerning Human Understanding* (1690). Under pressure of philosophical criticism from friends, including William Molyneux and Philipp van Limborch, Locke revised this Chapter of the *Essay* several times, most notably in the second edition (1694), fourth edition (1700), and fifth edition (1706). In the second edition, Locke gave up important theses of the first edition, a change that necessitated the complete rewriting of sections 28ff. For ease of reference, I am going to refer to the author of the first edition of the *Essay* as 'Locke<sub>1</sub>', to the author of the second edition of the *Essay* as 'Locke<sub>2</sub>', and so on. Where there is agreement across all five editions, I will refer to the author of the *Essay* as 'Locke'.

Like Bramhall and Hobbes, Locke conceives of the will as a power or faculty of mind. And like Hobbes, Locke has no patience for Bramhall's hypostatization of the will:

[The scholastic] way of Speaking of *Faculties*, has misled many into a confused Notion of so many distinct Agents in us, which had their several Provinces and Authorities, and did command, obey, and perform several Actions, as so many distinct Beings; which has been no small occasion of wrangling, obscurity, and uncertainty in Questions relating to them. (*Essay* II. xxi. 6: 237)

But Locke's view about the nature of the will changed between the first and second editions of the *Essay*. According to Locke<sub>1</sub>, the will is a 'Power the Mind has to prefer the consideration of any *Idea*, or the forbearing to consider it; or to prefer the motion of any part of the body to its rest, and *vice versa* in any particular instance' (*Essay* II. xxi. 5: 236). Locke<sub>1</sub> therefore thinks of the will as a faculty of preferring or desiring mental operations and corporeal actions. Correspondingly, Locke<sub>1</sub> thinks of acts of will, namely volitions, as particular preferences or desires (*Essay* II. xxi. 28: 248). In this, Locke<sub>1</sub>'s views recapitulate Hobbes'.<sup>20</sup> Indeed, like (p. 408) Hobbes, and largely for the same reasons, Locke<sub>1</sub>'s conception of the will leads him to deny the possibility of *akrasia*: preference or desire always being directed at the good (or the apparent good), it is impossible for the mind to knowingly will (and hence do) something bad. On this view, 'Good then, *the greater Good is that alone which determines the Will*' (*Essay* II. xxi. 29: 251).

But by 1694, Locke<sub>2</sub> has come to recognize that experience speaks strongly in favour of weakness of will. Thus, 'let a Drunkard see, that his Health decays, his Estate wastes ... yet ... the habitual thirst after his Cups, at the usual time, drives him to the Tavern' (*Essay* II. xxi. 35: 253). And indeed, like Bramhall and Cudworth, and against Hobbes, Locke<sub>2</sub> recognizes the truth of Ovid's dictum: *Video meliora proboque, Deteriora sequor* (I see and I desire the better, but I follow the worse; see footnote 6) (*Essay* II. xxi. 35: 254). And this recognition drives Locke<sub>2</sub>'s abandonment of Locke<sub>1</sub>'s identification of the will with the faculty of desire. What Locke<sub>2</sub> sees is that 'Desire ... in the very same Action may have a quite contrary tendency from that which our *Wills* sets us upon' (*Essay* II. xxi. 30: 250). Thus, '[a] Man, whom I cannot deny, may oblige me to use persuasions to another, which at the same time I am speaking, I may wish may not prevail on him' (*Essay* II. xxi. 30: 250). And the fact that 'the *Will* and *Desire* run counter' with respect to the same action at the same time establishes 'that *desiring* and *willing* are two distinct Acts of the mind' (*Essay* II. xxi. 30: 250). Instead, Locke<sub>2</sub> identifies the will with the 'Power which the mind has, thus to order the consideration of any *Idea*, or the forbearing to consider it; or to prefer the motion of any part of the body to its rest, and *vice versa* in any particular instance' (*Essay* II. xxi. 5: 236). The will, then, as Locke<sub>2</sub> conceives it, is a power to *command* (rather than to *desire*) mental operations and bodily motions (and hence volitions are individual mental commands (*Essay* II. xxi. 28: 248)).<sup>21</sup> Locke<sub>2</sub>'s conception of the



will therefore resembles Cudworth's conception of the hegemonic in being wholly non-desiderative. But, unlike Cudworth, Locke is very careful to avoid hypostatization of the will.

Locke<sub>1</sub>'s conception of voluntary action closely resembles Hobbes'. On Hobbes' view, an action is voluntary when it follows immediately the last appetite, which appetite Hobbes calls the agent's volition (or act of will). Similarly, Locke<sub>1</sub> holds (p. 409) that voluntary action is action that is consequent to the agent's preference, even 'the sitting still ... of a Paralytick, whilst he prefers it to removal' (*Essay* II. xxi. 11: 239). But Locke<sub>2</sub>'s understanding of voluntary action changes in keeping with his new theory of the nature of the will. For Locke<sub>2</sub>, an action is voluntary only when its forbearance or performance is 'consequent to [an] order or command of the mind' (*Essay* II. xxi. 5: 236).<sup>22</sup>

Locke's debt to Hobbes extends to his conception of freedom. Like Hobbes, Locke holds that there is no more to freedom than freedom of action, that is, the ability to do or forbear as one wills: 'so far as a Man has a power to think, or not to think; to move, or not to move, according to the preference [second edition: or direction] of his own mind, so far is a Man *Free*' (*Essay* II. xxi. 8: 237).<sup>23</sup> Locke realizes, as Hobbes does not, that voluntary actions can be unfree. In several places, Hobbes insists that 'free and voluntary are the same thing' (EW 5: 226), that 'all voluntary acts [are] free, and all free acts ... voluntary' (EW 5: 365). Locke disagrees, partly on the strength of hypothetical scenarios of the following sort (*Essay* II. xxi. 10: 238):

suppose a Man be carried, whilst fast asleep, into a Room, where is a Person he longs to see and speak with; and be there locked fast in, beyond his Power to get out: he awakes, and is glad to find himself in so desirable Company, which he stays willingly in, *i.e.* prefers his stay to going away. I ask, Is not this stay voluntary? I think, no Body will doubt it: and yet being locked fast in, 'tis evident he is not at liberty not to stay, he has not freedom to be gone.<sup>24</sup>

The point of the example, of course, is that it is possible to perform an action voluntarily, even as one is not free to forbear performing it.<sup>25</sup>

Locke considers the question whether it is appropriate to attribute freedom to the will, as Bramhall does. But, like Hobbes, Locke finds the question 'unreasonable, because unintelligible', for '*Liberty*, which is but a power, belongs only to (p. 410) Agents, and cannot be an attribute or modification of the *Will*, which is also but a Power' (*Essay* II. xxi. 14: 240). The fundamental problem, as Locke sees it, is that it is metaphysically impossible for powers to be endowed with powers. Powers are, as the scholastics would put it, modifications of substance, ways for a substance to be. As such, they cannot themselves be modified.

But the fact that the will cannot itself be free does not entail that humans are not free to will. Locke acknowledges the existence of two kinds of actions: mental and corporeal. Willing, as much as considering, combining, comparing, and abstracting ideas, is a mental action. So if human beings are free to perform *corporeal* actions (such as walking across the room or sitting still), aren't they also, at least in principle, free to perform *mental* actions (including willing) as well? Locke<sub>1</sub> considers this question, and, unlike any of his predecessors, divides it in two. There is, first, the question whether a human being is free '*in respect of willing any Action in his power once proposed to his Thoughts*' (*Essay* II. xxi. 23: 245). And second, there is the question '[w]hether a Man be at liberty to will which of the two he pleases, Motion or Rest' (*Essay* II. xxi. 25: 247).

There is significant scholarly controversy regarding how to understand Locke's answers to these questions. The standard view is that Locke<sub>1</sub> answers both questions *negatively*, but that changes made to the fifth edition of the *Essay* indicate that Locke<sub>5</sub>'s negative answers are no longer consistent with other aspects of his theory of volition. Concerning the first question, my own view is that Locke<sub>1</sub> answers it negatively, but that Locke<sub>5</sub> recognizes that the negative answer must be *qualified* in a way that remains consistent with the rest of his volitional theory; and concerning the second question, my view is that Locke<sub>1</sub> and Locke<sub>5</sub> both answer it *positively*, in a way that does not introduce inconsistency into their philosophical views as a whole.

The first question is whether humans are free to will or not to will with respect to action A, once the issue of whether to do A is proposed to them. To this question, Locke<sub>1</sub> appears to answer ‘No’. The reasoning is simple (see *Essay* II. xxi. 23: 245–6).<sup>26</sup> Let H be a human being who is considering whether to do action A. (1) Either A exists or A does not exist; (2) If A exists, it is only because H wills it to exist; (3) If A does not exist, it is only because H wills it *not* to exist. So, whether A exists or not, H must will (either that A exist or that A not exist). Therefore, with respect to any action once proposed to H’s thoughts, H cannot avoid willing, and hence is not free in respect of the act of willing. (Following Chappell 1994: 107, call this conclusion the Unavoidability Thesis.)

In his *New Essays* Leibniz famously reacts to this argument by denying premise (3). As he argues, it is possible for human beings to suspend willing one way or the other with respect to a particular action, and in such cases the non-existence of (p. 411) the action might well come about despite the absence of a prior volition to perform it (see Leibniz 1996: 181–2). Some scholars (e.g. Chappell 1994: 106–7) see this as a damning criticism, especially in light of the fact that Locke<sub>2–5</sub> themselves accept the Doctrine of Suspension (see *Essay* II. xxi. 47: 263; *Essay* II. xxi. 56: 270–1).

But in the end the criticism does not stick. Locke<sub>2</sub>, and later Locke<sub>5</sub>, make it absolutely clear that the argument at *Essay* II. xxi. 23–4 establishes only a *restricted version of the Unavoidability Thesis*. Locke’s point is *not* that it is with respect to willing *any* action that one is not free, but rather that it is with respect to willing *stoppings of processes in which one is currently engaged* that one is not free. Already in the first edition, Locke illustrates the Unavoidability Thesis by means of the following example:

[A] Man that is walking, to whom it is proposed to give off walking, is not at liberty, whether he *will* will, or no: He must necessarily prefer one, or t’other of them; walking or not walking. (*Essay* II. xxi. 24: 246)

Here it is clear that Locke is not thinking of an action that is to be performed at a later time, but rather one that is to be performed at the time it is being considered; and it is also clear that Locke is not thinking of *any* sort of action, but rather of an action *that consists in continuing or ending an already existing process*. This is something Locke<sub>5</sub> *emphasizes*. In the first edition, the passage continues:

[A]nd so it is in regard of all other Actions in our power; they being once proposed, the Mind has not a power to act, or not to act, wherein consists Liberty: It has not a power to forbear *willing*. (*Essay* II. xxi. 24: 246)

But in the fifth edition, the passage continues (with the additions underlined):

[A]nd so it is in regard of all other Actions in our power so proposed, which are the far greater number. For considering the vast number of voluntary Actions, that succeed one another every moment that we are awake, in the course of our Lives, there are but few of them that are thought on or proposed to the *Will*, ’till the time they are to be done: And in all such Actions, as I have shewn, the Mind in respect of *willing* has not a power to act, or not to act, wherein consists Liberty: The Mind in that case has not a power to forbear *willing*.

What these additions make clear is that Locke<sub>5</sub> does not accept the Unavoidability Thesis *in all generality*, but only accepts the version of the thesis that is restricted to those actions that are not ‘proposed to the *Will*, ’till the time they are to be done’, namely stoppings of processes in which one is currently engaged.

Importantly, when (3) is suitably restricted to this particular subset of the set of all actions, Leibniz’s objection no longer applies, and (3) seems incontrovertible. The restricted version of (3) states that *where A is the stopping of a process in which H is currently engaged*, if A does not exist, it is only because H wills it *not* to exist. This seems right: if the walking man considers whether to stop walking and indeed does stop walking, this is only because he *wills* not to continue walking. But if (p. 412) the suitably restricted version of (3) is true and Leibniz’s objection to the argument fails, then there is no reason to reject the suitably restricted version of the Unavoidability Thesis, a version that is perfectly compatible with the Doctrine of Suspension.



The second question is whether human beings are free with respect to their particular acts of willing. Suppose I will to move my arm. Is my volition to move my arm free? According to some scholars (e.g. Chappell 1994: 108), Locke answers this question negatively too. But this, I think, is a mistake.

The argument for Locke's answer appears in the following passage:

For to ask, whether a Man be at liberty to will either Motion, or Rest; Speaking, or Silence; which he pleases, is to ask, whether a Man can *will*, what he *wills*; or be pleased with what he is pleased with. A Question, which, I think, needs no answer: and they, who can make a Question of it, must suppose one Will to determine the Acts of another, and another to determinate that; and so on *in infinitum*. (*Essay II. xxi. 25: 247*)

Locke says here that the question whether a man is free with respect to his volitions is the same as the question whether a man 'can *will*, what he *wills*; or be pleased with what he is pleased with'. The answer to this question is obvious, indeed *obviously in the affirmative*, for it is obvious that what is actual is possible: what a man *does* is clearly something he *can do*. Chappell supposes that Locke takes the *question* to be absurd, when it is in fact the *answer* to the question that Locke takes to be absurd. As Locke sees it, the relevant question 'needs no answer' *precisely because* the correct answer to it is *obvious*. The reason is plain. Consider whether S is free with respect to any one of his volitions (say, V). According to Locke, S is free with respect to V if and only if: S can perform V if S wills to perform V, and S can fail to perform V if S wills not to perform V. But, as Locke sees it, to will to perform V is just to perform V and to will not to perform V is just to fail to perform V. Consequently, S is free with respect to V if and only if: S can perform V if S performs V, and S can fail to perform V if S fails to perform V. It follows immediately from the principle that actuality entails possibility that agents are all free with respect to their volitions.

Locke therefore provides a (qualified) negative answer to the first question and an unqualified positive answer to the second. On his view, human beings are free to will what they actually will, both because they have the power to will and because they have the power to suspend willing. Despite the general Hobbesian tenor of his theory of the will as a power rather than an agent, Locke's endorsement of the Doctrine of Suspension shows that his views do diverge significantly from Hobbes', and converge with Bramhall's and Cudworth's, in at least one important respect. One of Locke's great intellectual achievements, then, is that he was able to cull important insights from his predecessors without thereby cobbling together an internally incoherent theory.

(p. 413) But Locke's theory of will and motivation is not problem-free. Like Hobbes, but unlike Bramhall and Cudworth, Locke denies that the will is self-determined. Even in the case of free, voluntary actions, one's volitions are determined by one's desires, principally desires to be rid of pain or uneasiness. Thus if a subject S wills to suspend willing, what determines her volition to suspend is a desire D1 to be rid of pain, presumably pain at the thought of what would likely happen if she did not suspend. But now, on Locke's mature view, S has the power to suspend her prosecution of D1: she can fail to follow D1, precisely in order to consider whether following D1 conduces to her happiness. But given that the will is not self-determined, it follows that what determines S's suspension of the prosecution of D1 is another desire (call it 'D2') to be rid of pain, presumably pain at the thought of what would likely happen if she did not suspend her prosecution of D1. But Locke also holds that S has the power to suspend the prosecution of D2, and hence it follows from the rest of his views that what determines S's suspension of the prosecution of D2 is yet another desire (call it 'D3') to be rid of pain. And thus we are led to accept the existence of an infinite regress of desires and volitions to suspend them. This infinite regress problem, one that Locke himself never considered, continues to plague Lockean accounts of the relation between volition and motivation.

## 17.5 Conclusion

The development of philosophical opinion on the subject of will and motivation in seventeenth-century Britain is complex but rational. The story begins with an acrimonious debate between a strong proponent of a form of incompatibilist

Aristotelianism (Bramhall) and a vigorous exponent of the new scientific, compatibilist and anti-Aristotelian, mechanical philosophy (Hobbes). This debate, which frames the conversation on these topics for the next fifty years, is altered by the powerful but occasionally confused contributions of the incompatibilist and anti-Aristotelian Cambridge Platonists (such as Cudworth), and reaches its apotheosis in the work of Locke. It is a strong testament to Locke's intellectual honesty that he finds the need to craft a theory of freedom and voluntariness that borrows insights from *all* of his predecessors. This theory, though not problem-free, is remarkable in its coherent explanation of the possibility of weakness of will and its accommodation of the Doctrine of Suspension within a compatibilist, Hobbesian conception of freedom as freedom of action. Locke's theory remains a shining paradigm of generous intellectual synthesis, and in this respect deserves our everlasting admiration.

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## Notes:

(1) Bramhall writes that 'notwithstanding the judgment of the understanding, the will may still suspend its own act' (EW 5: 74), and 'the will may either will or suspend its act' (EW 5: 375).

(2) On Bramhall's view, the main enemy of voluntariness (and hence of freedom) is ignorance (EW 5: 83): 'Invincible and antecedent ignorance doth destroy the nature of spontaneity or voluntariness, by removing that knowledge which should and would have prohibited the action. As a man thinking to shoot a wild beast in a bush, shoots his friend, which if he had known, he would not have shot. This man did not kill his friend of his own accord.'

(3) See EW 5: 59–60. Bramhall adds that God and the good angels have liberty of exercise without having liberty of specification, for though they can choose to will or not, their choices are determined by the good and hence 'they cannot do and not do both good and evil'.

(4) For the agreement between Hobbes and Bramhall on the nature of free agency, see EW 5: 393, 402.

(5) Hobbes writes (EW 5: 288–9): 'There is nothing rational but God, angels, and men.'

(6) In defense of the possibility of *akrasia*, Bramhall quotes Medea's famous speech from Ovid's *Metamorphoses*: *Video meliora proboque, Deteriora sequor* [I see and I desire the better, but I follow the worse]—see EW 5: 315. Medea is referring to her irresistible love for Jason, leader of the Argonauts, and a stranger to her father's kingdom. Medea recognizes that it would be better for her not to marry a stranger, and yet, overpowered by her love for him, decides to marry Jason anyway. Hobbes replies to the example as follows: 'the saying, as pretty as it is, is not true. For though Medea saw many reasons to forbear killing her children, yet the last dictate of her judgment was that the present revenge on her husband outweighed them all; and thereupon the wicked action followed necessarily' (EW 5: 317). Interestingly, Hobbes does not tackle the case of Medea's decision to marry Jason, but rather her later far more calculated and cold-blooded decision to kill the children she had borne him in order to get back at him for having spurned her.

(7) For a different reading of Hobbes' position on whether voluntariness presupposes deliberation, see Sleight, Chappell, and Della Rocca 1998: 1219.

(8) Hobbes writes (EW 5: 34): 'No man can determine his own will, for the will is appetite; nor can a man more determine his will than any other appetite, that is, more than he can determine when he shall be hungry and when not. When a man is hungry, it is in his choice to eat or not to eat; this is the liberty of the man; but to be hungry or not hungry ... is not in his choice'. See also EW 5: 174–5: 'It is a truth manifest to all men, that it is not in a man's power to-day, to choose what will he shall have to-morrow, or an hour, or any time after'.

(9) Hobbes also denies Bramhall's claim that a human being has the power to suspend (or refuse) what he wills, insisting on its absurdity: 'To refuse what one willeth, implieth a contradiction' (EW 5: 295).

(10) Notice Hobbes' use of 'and', which I have underlined in the text. Chappell 1999: xviii says that Hobbes' position is better expressed with 'or' rather than 'and'. Sleight, Chappell, and Della Rocca 1998: 1224 claim that Hobbes' position is correctly expressed as follows: '*m* is free with respect to *d* ... if and only if *m* both wills to do *d* and is able to do *d*'. My own view is that neither of these restatements is accurate to the relevant texts (see below).

(11) Admittedly, the converse is arguably false, that is, it is arguably false that if *X* has finished deliberating, then there are no external impediments to *X*'s doing *A*. But Hobbes does not acknowledge this as a problem, and it is reasonable to suppose that he is simply oblivious to it.

(12) Hobbes' third a priori argument for determinism is obviously sophistical, as Bramhall well recognizes (EW 5: 413–14).

(13) Cudworth writes (EIM VI: 169): 'if the blind will do alway[s] necessarily follow a necessary dictate of the understanding antecedent, then must all volitions and actions needs be necessary'.

(14) Cudworth writes (EIM XVIII: 199): 'if there be motion in the corporeal world, as there is, and no part of it could ever move itself, then must there of necessity be some unmoved or self-moving thing as the first cause thereof, something which could move or act from itself without being moved or acted upon by another. Because if nothing at all could move or act by

itself, but only as it was moved or acted upon by another then could not motion or action ever begin, or ever have come into the world’.

(15) Cudworth writes (EIM XIII: 185): ‘This faculty of ... power over ourselves, which belongs to the hegemonicon of the soul ... is intended by God and nature for good, as a self-promoting, self-improving power, in good, and also a self-conserving power in the same, whereby men [receive] praise of God, and their persons being justified and sins pardoned through the merits and true propitiatory sacrifice, have a reward graciously bestowed on them by God, even a crown of life’.

(16) For example, Cudworth writes of ‘the soul’s hegemonic or power over itself’ (EIM XI: 182).

(17) For example, Cudworth writes of a ‘power over ourselves, which belongs to the hegemonicon of the soul’ (EIM XIII: 185), and insists that ‘there is in us some one hegemonical, which comprehending all the other powers, energies, and capacities of our soul ... having a power of intending and exerting itself more or less, determineth, not only actions, but also the whole passive capability of our nature one way or other’ (EIM XVI: 193).

(18) For example, in the chapter of the *Treatise on Free Will* in which he explicitly addresses the question of the nature and identity of the hegemonic, Cudworth writes (X. 178): ‘I say, therefore, that the [hegemonicon] in every man ... is the soul as comprehending itself, all its concerns and interests, its abilities and capacities, and holding itself, as it were in its own hand, as it were redoubled upon itself, having a power of intending or exerting itself more or less in consideration and deliberation, in resisting the lower appetites that oppose it’, and so on.

(19) There is also this passage (EIM XVI: 195): ‘God Almighty could not make such a rational creature as this is, all whose joints, springs, and wheels of motion were necessarily tied together, which had no self-power, no hegemonic or ruling principle, nothing to knit and [unite] the multifarious parts of the machine into one, to steer and manage the conduct of itself’.

(20) The fact that Locke<sub>1</sub> and Hobbes agree on the nature of the will does not entail that they agree on the nature of desire. In keeping with his corpuscularian mechanism, Hobbes identifies individual desires or appetites with small beginnings of motion in the body. It is unclear whether Locke<sub>1</sub> follows Hobbes in this. For Locke<sub>1</sub>, who is far less dogmatic and more wedded to the experimental method than Hobbes, thinks of corpuscularian mechanism as the best available scientific hypothesis of his time, one that might well be superseded by better hypotheses that account for the anomalies (such as electricity, magnetism, gravity, and cohesion) that plagued the mechanism of his day. For more on Locke’s relation to mechanism, see Downing 1998.

(21) As the quotation from *Essay* II. xxi. 5 indicates, Locke<sub>2</sub>’s revisions of the first edition of the *Essay* are not thoroughgoing. In the second and subsequent editions of the *Essay*, there remain passages in which Locke appears to identify the will with the power of preferring or desiring, rather than with the power to issue mental orders. Interestingly, Locke<sub>2</sub> recognizes this, acknowledging that he has ‘endeavoured to express the Act of *Volition*, by *chusing*, *preferring*, and the like Terms, that signify *Desire* as well as *Volition*, for want of other words to mark that Act of the mind, whose proper Name is *Willing* or *Volition*’ (*Essay* II. xxi. 30: 249).

(22) It is not clear what Locke builds into the notion of ‘consequence’ here. Is the mere fact that act A is (immediately) temporally posterior to the volition to A sufficient for A to count as voluntary? Locke does not say, but we may presume on his behalf that he would answer this question in the negative. For it is easy to imagine situations in which X wills to do A but then later does A by accident or under compulsion. In order to count as voluntary, the doing of A must clearly be *caused* by a prior volition to A. But this brings up another question: Is the mere fact that act A is caused by the volition to A sufficient for A to count as voluntary? Again, Locke does not say. But we may presume on his behalf that he would answer *this* question positively. Here I agree with Lowe 1986, 2005 and Sleight, Chappell, and Della Rocca 1998, and disagree with Yaffe 2000.

(23) Yaffe 2000 argues that Locke<sub>2</sub>’s conception of freedom extends beyond freedom of action in requiring the power to bring it about that one’s volitions are determined by the good. For criticisms of Yaffe’s non-Hobbesian account of Locke’s

conception of free agency, see Rickless 2001.

(24) This example may have been inspired by a similar example of Bramhall's, one involving a man deliberating 'whether he shall play at tennis [while] at the same time the door of the tennis-court is fast locked against him' (EW 5: 346).

(25) Locke's example of the 'Paralytick' at *Essay* II. xxi. 11, mentioned above, serves the same purpose.

(26) For a very helpful and more detailed rendition of the reasoning, see Chappell 1994.

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## Hedonism and Virtue

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## Abstract and Keywords

This chapter examines the views of seventeenth-century British philosophers on the relation between virtue and hedonism, explaining that many philosophers believed that a defense of virtue required rejection of hedonism. It discusses the reformulation of moral philosophy proposed by Thomas Hobbes, and analyzes the reactions of Richard Cumberland and Cambridge Platonists Ralph Cudworth and Henry More. The chapter also considers the revival of Epicureanism and early modern natural law theory.

Keywords: virtue, hedonism, moral philosophy, Thomas Hobbes, Richard Cumberland, Ralph Cudworth, Henry Moe, Epicureanism, natural law theory

VIRTUE and pleasure have often been thought to stand in tension with each other. Not all philosophers have believed this, but many have regarded a life devoted to the pursuit of pleasure as the antithesis of a virtuous life. A virtuous person is one who is consistently motivated to pursue right actions for their own sake. The just person, for example, is disposed to act justly in her dealings with others, with such actions requiring no further motivation or justification than that they are just. One of the principal challenges to this conception of virtue is presented by the ancient philosopher Epicurus and his followers who defend the doctrine of hedonism. For Epicureans, virtue is only instrumentally valuable as a means to pleasure. The Epicureans' main ancient opponents, the Stoics, and later critics such as Cicero, found such a view unacceptable because it accorded insufficient weight to virtue. A person whose primary goal was pleasure could not be expected to give the appropriate attention to the requirements of virtue: faced with a choice between actions that demanded moderation, courage, or justice and actions that promised significant pleasure (or significantly less pain), he would inevitably choose the latter—to the detriment of virtue. Such criticisms were repeated by theologians and moralists throughout the ancient and medieval periods, and remained a stock criticism of Epicurean views in seventeenth-century Britain.

It is important at the outset to distinguish three varieties of hedonism that are often conflated. *Psychological* hedonism is a thesis about motivation. On this view, (p. 416) a person is only ever motivated by the anticipation of pleasure and the avoidance of pain. *Axiological* or *value* hedonism is a thesis about the ground of value, namely, that pleasure is the only thing good in itself and hence worth pursuing for its own sake, and pain the only thing bad in itself and hence worth avoiding for its own sake. Finally, *ethical* hedonism is the thesis that the actions of rational agents ought to be directed by considerations of pleasure and pain. Most often this view is embraced by consequentialists who also accept value hedonism. Thus, for ancient Epicureans, our actions ought to be directed towards the goal of a pleasing life, in which bodily pain and mental disturbance are minimized.

Each of these species of hedonism poses a significant threat to the claims of virtue. If psychological hedonism is true, then

an agent is only ever motivated by the prospect of pleasure or the avoidance of pain. Given this, we may wonder whether virtue is even possible, since no agent will possess the distinctive form of motivation characteristic of a virtuous person. If axiological hedonism is true, a challenge can be raised to the value of virtue. Even if an agent is disposed to act courageously or justly, the value of such actions (and of the states of character from which they originate) will depend upon the contribution they make to the attainment of pleasure or the avoidance of pain. Similarly, if ethical hedonism is true, then whether virtue ought to be pursued will depend upon whether it can be shown that virtuous action, or the cultivation of a virtuous character, is an effective means to the promotion of pleasure.

For many philosophers in seventeenth-century Britain, a defence of virtue as the centrepiece of a moral life entailed a rejection of hedonism. Such views were expressed in the face of efforts by other thinkers to revive the teachings of Epicurus, while demonstrating their consistency with Christianity and the requirements of morality. Associated principally with the French philosopher Pierre Gassendi, this effort was popularized in England by, among others, Walter Charleton in the second half of the century. Rightly or wrongly, many critics identified Hobbes' innovative doctrines with the revival of Epicureanism and saw them as undermining conventional notions of virtue. At the same time, defenders of virtue embraced the idea that happiness is best understood as a kind of refined pleasure or tranquility. This, largely unconscious, concession to Epicureanism brought with it unforeseen consequences. It was generally acknowledged that human beings have a natural and ineliminable desire for happiness. If the desire for happiness is just the desire for a kind of pleasure, then a large step has been taken towards meeting the claims of Epicureans.

In what follows we trace the development of this set of ideas in a number of leading seventeenth-century British thinkers. We begin by considering its immediate background in early modern natural law theory and the revival of Epicureanism. We then turn to the radical reformulation of moral philosophy advocated by Hobbes, and the reactions to his views offered by the Cambridge Platonists Ralph Cudworth and Henry More, and by Richard Cumberland. Finally, we consider the (p. 417) position defended at the end of the century by Locke, who attempts to reconcile the competing claims of virtue and pleasure.

## 18.1 Background

### 18.1.1 Natural Law Theory

A useful way of gauging the transformation of moral philosophy in seventeenth-century Britain is to begin with Richard Hooker's landmark *Of the Laws of Ecclesiastical Polity*, published in 1593. Although Hooker's focus was a defence of the tenets and practices of the Church of England, his account of morality follows that of the thirteenth-century theologian Thomas Aquinas, whose theory of natural law was widely influential among both Catholics and Protestants.<sup>1</sup> Aquinas adopts Aristotle's teleological conception of human action, and his doctrine that the fundamental end of human beings is the attainment of their characteristic good or perfection, which is identical to their happiness. Like Aristotle also, Aquinas holds that this good requires the cultivation of excellences of character, exemplified by the virtues of wisdom, moderation, courage, and justice. Christian natural law theory adds to Aristotle's perfectionism the idea that there is a divinely sanctioned universal natural law, and that this law directs us to respect our own nature as rational beings, our kinship with other human beings, and our dependence on God as creator and lawgiver. Accordingly, natural law commands wisdom and moderation in all our actions, justice in our dealings with others, and honour and love towards God.

As created by God, human beings are naturally responsive to this law, but they are also pulled away from lawful action by the desire for pleasure. To the extent that they obey the 'dictates of right reason', they act virtuously and in a way that promotes the attainment of their good.<sup>2</sup> As conceived by Hooker, human beings have both an inherent motive and an overriding reason to pursue this end. This follows from God's creation of a universe in which all things naturally act in ways directed towards their end, and in which the end of human beings is specified in terms of their union with God, which they pursue under the guise of a desire for (p. 418) happiness (Hooker 1989: 74–5). Happiness is thus a natural and necessary end for human beings, yet the desire for happiness cannot be fully satisfied through the pursuit of pleasure, or even



knowledge and virtue, but only through union with God in a life after death (1989: 111–17).

This traditional formulation of Christian natural law theory, reaffirmed by Hooker, is subject to an extensive rethinking in the writings of the Dutch jurist Hugo Grotius, whose major work *De jure belli ac pacis* (*On the Law of War and Peace*) (1625) set a new direction for the understanding of morality in both Britain and on the Continent. Grotius' most important innovation is to detach natural law from the teleological perfectionism of Aquinas and his followers and to render it primarily (if not exclusively) an issue of secular political concern. The question is not: what are the laws of reason by which human beings can attain their greatest perfection and happiness? But rather: what source, if any, is there for principles of justice and right that are binding on human beings in general, irrespective of their political and religious allegiances?<sup>3</sup>

Grotius famously opens his work by raising the challenge, attributed to the ancient sceptic Carneades, that the good of others is not an intrinsic part of an agent's own good (as it is on most perfectionist accounts), and that in some cases the pursuit of others' good may be detrimental to an agent's interests. By identifying an agent's good with what is useful or advantageous to her, and detaching the notion of advantage from a perfectionist framework, Grotius' sceptic poses a powerful objection to the authority of morality: why respect the demands of morality if there is nothing in it for *me*?

Grotius frames the sceptic's objection confident that he has a compelling response to it. The basis of natural law, he argues, is to be found in human nature itself, which is expressed not just in the desire for personal advantage, but also in the desire to live in society with other human beings (Grotius 1925: 11). The precepts of natural law reflect our understanding of how best to satisfy the latter desire. Thus, acting justly is but a special case of our ability to act prudentially, in accordance with our rational nature. In principle, there is no conflict between what is demanded by 'right reason' and what is to our advantage.

Grotius does not neglect entirely the theological dimension of the laws of nature. He goes on to suggest that, in addition to their ground in human nature, such laws can be understood as commanded by God, at least in the sense that God has created human beings such that through the exercise of reason they judge the laws to be binding on them. Yet our experience of the binding character of the laws does not require that we understand them in this way. Grotius argues that his reply to the sceptic stands, 'even if we should concede that which cannot be conceded without (p. 419) the utmost wickedness, that there is no God, or that the affairs of men are of no concern to Him' (1925: 13). Grotius' willingness to entertain the idea that the authority of natural law can be explained in a way that makes no reference to God points towards the position of Hobbes and can be seen as at least part of the inspiration for it.

### 18.1.2 The Revival of Epicureanism

A second major influence on the development of moral philosophy in seventeenth-century Britain is the increasing prominence of the views of Epicurus. Historically, western Christianity had been hostile to Epicureanism based on its rejection of a providential creator and the immortality of the soul.<sup>4</sup> In the domain of ethics, much of the available evidence of Epicurus' philosophy derives from Cicero, who paints a strongly negative picture of its doctrine of hedonism. Cicero identifies hedonism with the narrow pursuit of self-interest and an excessive attention to sensual pleasure, both of which he takes to be inconsistent with a proper regard for virtue: 'Justice totters, or rather falls flat, along with all the virtues that are found in sociability and in the fellowship of the human race. For there can be neither goodness nor liberality nor courteousness, no more than friendship, if these are not sought for their own sakes, but are directed toward pleasure or benefit.'<sup>5</sup> For Cicero, upholding the claims of virtue entails rejecting all forms of hedonism. These doctrines cut against the principle that virtue is to be sought for its own sake, and that a proper estimation of its value requires a conception of the human good that transcends a narrow notion of self-interest or advantage. For many early Christian moralists, these arguments were decisive in supporting their rejection of Epicurean ethics.

During the early modern period, the most significant attempt to revive Epicurus' teachings in natural philosophy and ethics was carried out by the French philosopher Pierre Gassendi.<sup>6</sup> Gassendi's interest in Epicurus was motivated by his dissatisfaction with Aristotelian philosophy and its inability to explain the phenomena of the natural world. In order to argue against contemporary Aristotelians, he sought an alternative theory, and in doing so recognized the necessity to make this

alternative compatible with Christian theology. He began in his 1647 work *De vita et moribus Epicuri* by attempting to rehabilitate the reputation of Epicurus as a philosopher whose life exemplified the virtues upheld by Cicero and other moralists. Provided that one correctly understands the Epicurean notion of (p. 420) pleasure, he argued, Epicurus' views are consistent with living as a virtuous person. What is valued by the Epicurean are not isolated moments of pleasure, but a life in which one enjoys bodily health and a mind free of disturbance—with the latter being achieved by inculcating habits of moderation, liberality, friendship, and justice that exemplify the traditional virtues.<sup>7</sup>

Gassendi presented his defence of Epicureanism in a number of books, the last of which, *Syntagma philosophicum*, was published posthumously in 1658. His work was promulgated widely through the French translations of François Bernier, and in England through the publications of Walter Charleton and Thomas Stanley, the latter of whose *History of Philosophy* (1660) included a significant portion of Gassendi's writings on Epicurus in English.<sup>8</sup> Prior to this Charleton had published several books offering sympathetic accounts of Epicurus' views, among them *Physiologia Epicuro-Gassendo-Charltoniana* (1654) and *Epicurus' Morals* (1656). In addition to his interest in Epicurean atomism, which had an obvious relevance for developments in natural philosophy, Charleton aimed to correct unfavourable interpretations of Epicurean ethics by arguing that neither Epicurus' own character nor his doctrines supported the charge of immoralism.<sup>9</sup>

The writings of Gassendi and his English followers made the case that Epicurean hedonism was more than mere sensualism. The pleasure it advocated was of a refined sort, associated with virtuous action and with the affects that characterize the piety of a devout Christian. Modifying Epicureanism as the Gassendists did to allow for divine providence and the immortality of the soul, it could be argued that there was no reason to question the moral or religious standing of those with Epicurean sympathies. This is not to say that the term 'Epicurean' ceased to function as an epithet of abuse. It continued to have this sense in the second half of the seventeenth century. Nevertheless, the case could now be made that the adoption of Epicurean principles did not imply a narrow notion of the good as personal advantage, which could be realized independently of an observance of morality. On the contrary, only by living a virtuous life could one hope to enjoy the sort of pleasure that Epicurus identified as the *summum bonum*.

In this way, the arguments of the Epicureans dovetailed with the conclusions of Grotius' natural law theory, which likewise defended the claims of natural law against the critic who sought to limit rational action to that which promoted personal advantage. The two accounts remain formally distinct, one adhering to (p. 421) the framework of Greek eudaimonism, the other eschewing it; nevertheless, they meet in the conclusion that the prudential agent has reason to act in ways that take into account the well-being of others. Grotius' version of modern natural law theory is undoubtedly the more innovative of these positions, but in Britain it was soon surpassed by an even more radical reinterpretation of morality at the hands of Thomas Hobbes.

## 18.2 Hobbes

In the minds of many of his contemporaries, Hobbes' philosophy was closely associated with the revival of Epicureanism. While there is, as we shall see, some justification for this charge, not least his friendship with Gassendi, Hobbes' challenge to the foundations of traditional morality goes well beyond that of Epicurus.<sup>10</sup> Hobbes begins from the fact of moral disagreement and like Grotius appeals to laws of nature as principles upon which a stable society can be constructed; but Hobbes takes his diagnosis of normative conflict to a deeper level and offers a more pessimistic assessment of the prospects for success. Where Grotius identifies a desire for society as a foundation for universal laws of nature, Hobbes credits human beings with conflicting social and anti-social tendencies that render a peaceful society a far-from-certain outcome. Hobbes adds to this a wide-ranging critique of the significance of normative language. The result is that he leaves it unclear not just whether human beings can live up to the standards of morality, but whether those standards have any sense independently of the power of a sovereign to enforce them.

Throughout his writings Hobbes expresses scepticism about the attempts of his predecessors to establish definitive

conclusions about virtue and vice, the good and happiness. His criticisms go beyond identifying the shortcomings of particular philosophers' positions and target instead the general attempt by philosophy to establish objective truths about virtue and the good. Hobbes' reasons for thinking this combine metaphysical, epistemological, and semantic considerations. He is a materialist, who believes that mental functions are to be explained as mechanical processes involving no more than the motions of matter. He is an empiricist, who holds that all cognition is grounded in particular sense experiences and that there are, strictly speaking, no universal notions of which we have any comprehension. According to Hobbes, we rely extensively on universal terms to record and convey our experience of the world; however, the reference of these terms is limited to (p. 422) bodies, their properties, the effects of other bodies on our body, and the parts of language itself (Hobbes 1994: 4.15–18).

For Hobbes, perennial conflict about the central notions of morality, politics, and religion is explained by the way in which normative language enters human discourse. His account takes as its starting point human passions, defined as 'the interiour beginnings of voluntary motions'. Of these 'small beginnings of motion', he distinguishes two basic types, corresponding to the primary passions of appetite and aversion (Hobbes 1994: 6.2). Appetite and aversion are distinguished solely by the direction of motion, towards or away from an object; and Hobbes maintains that all other passions can be explained in terms of these two, whose names are 'for divers considerations diversified' (Hobbes 1994: 6.13).

To this, Hobbes adds a second claim about the significance of evaluative language:

But whatsoever is the object of any man's appetite or desire that is it which he for his part calleth *good*: and the object of his hate, and aversion, *evil*; and of his contempt, *vile* and *inconsiderable*. For these words of good, evil, and contemptible are ever used with relation to the person that useth them, there being nothing simply and absolutely so, nor any common rule of good and evil to be taken from the nature of the objects themselves. (Hobbes 1994: 6.7)

According to Hobbes, we call 'good' that which we desire, and 'evil' that for which we have an aversion. Because the reference of value terms is fixed in this way, he says, 'one cannot speak of something as being *simply good*, since whatsoever is good, is good for someone or other'. Furthermore, given the diversity of human appetites and aversions, disagreement among individuals about the goodness and badness of objects is inevitable: 'Since different men desire and shun different things, there must needs be many things that are good to some and evil to others; so that which is *good* to us is *evil* to our enemies'.<sup>11</sup>

Hobbes consistently maintains that the meaning of the terms 'good' and 'evil' is determined by the varying appetites and aversions of different individuals. It is less clear, though, whether he believes that appetite and aversion as such endow things with value, or render them things that an agent has reason to pursue or avoid. In expanding on the multiple uses of the terms 'good' and 'evil', he writes:

The names of *good* and *evil* also vary in a number of different ways. For the same thing that, as desired, is said to be good, is said to be *pleasing* as acquired; the thing that, as desired, is said to be good, is said to be *pulchrum* when contemplated. For *pulchritudo* is that quality in an object that makes one expect good from it. For whatsoever things are seen as similar to those that have pleased, seem as though they would please. Therefore *pulchritudo* is an indication of future good.<sup>12</sup>

(p. 423) Hobbes may be intending here to define the pleasing in terms of the satisfaction of desire: to say that a thing is pleasing is just to say that it is good, i.e. an object of desire, which has been successfully obtained. But in this passage an independent notion of pleasure as an affect valued for its own sake seems to endure. To expect good from an object that has pleased us in the past makes little sense, if 'pleased' means simply 'was the object of a satisfied desire'. It is more plausible to say that we expect good from such an object because we have experienced it *as pleasing*, that is, we have derived pleasure from it. If this is so, then a residue of hedonism persists in Hobbes' philosophy. Pleasure as such is good, an affective state for which we have a natural affinity or appetite; pain as such is evil, an affective state for which we have a

natural aversion.

Hobbes' mechanistic theory of the passions confirms that there is an important sense in which pleasure and pain are explanatorily prior to appetite and aversion. Understood materially, the sense of pleasure or pain is a quickening or slackening of the vital motion of blood originating in the heart. In his version of the ancients' cradle argument, Hobbes postulates that from the earliest stages of human life there is a natural motion towards that which pleases (appetite), and a natural motion away from that which pains or troubles us (aversion).<sup>13</sup>

Hobbes thus ascribes the origin of our appetite or aversion for something to its capacity to produce pleasure or pain in us. Whether or not we *call* things good and evil on the basis of our desire or aversion for them, the reason why we pursue them is that they are perceived as sources of pleasure or pain, to which we are naturally responsive. Whenever we have appetites or aversions for certain objects, he writes, 'a preconception of future pleasure and pain necessarily follows from those objects'.<sup>14</sup> Given this, it is plausible to conclude that, for Hobbes, we act for the sake of the attainment of pleasure and the avoidance of pain. While it may be going too far to characterize him as a value hedonist, someone who maintains that the only good is pleasure and the only bad, pain, he is a psychological hedonist, who explains human action in terms of the pursuit of pleasure and the avoidance of pain.

The identification of pleasure and pain as common motivating factors in human beings does not lessen the threat of normative conflict. Even if people could be brought to acknowledge that in seeking what they call 'good' and 'evil', they were ultimately seeking pleasure (or the avoidance of pain), it would not follow that they would agree about which goods should be pursued and how they should be distributed. Since pleasure is the consequence of the satisfaction of desire, and desires vary widely, disagreement about ends is ineliminable in the state of nature.

Although Hobbes stresses the pervasiveness of disagreement about the things people call 'good' and 'evil', he nonetheless acknowledges a core set of ends about (p. 424) which human beings generally agree. All, or almost all, human beings desire to live in conditions of peace, in community with their neighbours, and with a level of comfort that goes beyond satisfaction of the basic needs of life. Furthermore, Hobbes credits human beings with an understanding of the means necessary to attain these ends and a disposition to act in accordance with those means. The latter he identifies with the laws of nature, which he characterizes as the 'science of virtue and vice':

[A]ll men agree on this, that peace is good; and therefore also the way or means of peace (which, as I have shewed before, are *justice, gratitude, modesty, equity, mercy*, and the rest of the laws of nature) are good (that is to say, *moral virtues*), and their contrary vices, evil. Now the science of virtue and vice is moral philosophy; and therefore the true doctrine of the laws of nature is the true moral philosophy. (Hobbes 1994: 15.40)

Hobbes' account of virtue is essentially the Epicurean one. The virtues, which he identifies with dispositions to act in accordance with the laws of nature, are desirable (or good) because they are necessary means to the end of 'peaceable, sociable, and comfortable living' (Hobbes 1994: 15.40). Taking the latter as equivalent to what Hobbes calls 'felicity', we in effect have the thesis that the virtues are valuable because they stand in an instrumental relation to happiness.<sup>15</sup>

We may take Hobbes, then, as supporting an ethical outlook that is predominantly Epicurean. However, he does not propose this as a solution to the problem of normative conflict. The situation is complicated by two observations he makes about human psychology. First, there are individuals for whom 'peaceable, sociable, and comfortable living' is not an end. Such individuals are more strongly motivated by the desire for riches or honour than the desire for peace and comfort. Second, given the presence of such individuals, even agents who would in other circumstances comport themselves with virtue have a motive for acting otherwise: fear of their neighbours may lead them to neglect their own long-term well-being and perpetuate a state of war (Hobbes 1994: 13).

The combination of these factors shows why an ethical solution to the problem of conflict is insufficient, and why it must be supplemented by a political solution in the form of the institution of a commonwealth. In describing the motivation of human

beings to cede their right of self-government to a sovereign, Hobbes lays primary emphasis on the motive of fear, especially fear of violent death. The first two laws of nature express the conditions for leaving the state of nature and entering a commonwealth in which one's security is guaranteed. As means to this end, the laws of nature enjoin human beings, first, to seek peace so far as it is seen (p. 425) to be possible, otherwise war; and, second, to be willing to lay down their natural right to all things in exchange for others doing likewise (Hobbes 1994: 14.4–5).

The interpretation of Hobbes' doctrine of the laws of nature has been a long-standing source of controversy.<sup>16</sup> To the extent that a coherent position can be discerned in his texts, it consists of two main theses: (1) the laws of nature are 'immutable and eternal' principles that (a) express necessary means to the ends of peace and self-preservation, and (b) 'oblige *in foro interno*' in so far as it is a psychological necessity that (almost) any human being is 'bound' to 'a desire they should take place'. That is, given the universal desire for self-preservation, no human being will knowingly act in ways that tend 'to procure his own certain ruin' (Hobbes 1994: 15.36–8); (2) the laws of nature are principles that obligate action, in the sense that disobedience to the law is an instance of wrong-doing that is rightfully punished, only when they are commanded by the sovereign of a commonwealth. The 'science of virtue and vice' that Hobbes identifies with the 'true moral philosophy' can be seen as an extension of (1), which links observance of the laws of nature not just to the preservation of life, but to the promotion of 'peaceable, sociable, and comfortable living'. In this case, likewise, the laws of nature may be understood as expressing means to an end that (almost) every human being is motivated to seek.

Missing from Hobbes' theory is any recognition of the laws of nature as moral principles that obligate or command by the force of reason alone. In contrast to Grotius, he denies that there is any universal 'unwritten law' that can serve as a foundation for the resolution of normative conflict (Hobbes 1994: 26.22). On Hobbes' account, there are psychological tendencies that dispose human beings to prudential action and obedience (as well as tendencies that work against these outcomes), and there are laws properly speaking that obligate human beings by virtue of being commanded by a sovereign. Beyond this, there is no universal system of morality, no doctrine of good, right, virtue, or law, which can be appealed to as a standard against which human actions can be judged and their agents held accountable.<sup>17</sup> This consequence of Hobbes' philosophy was apparent to his contemporaries and, combined with his reputation for materialism and irreligion, made Hobbes one of the most reviled intellectual figures in seventeenth-century Britain.

### (p. 426) 18.3 The Cambridge Platonists

Among the principal opponents of Hobbes' thought were the theologians and philosophers collectively known as the Cambridge Platonists.<sup>18</sup> As the name implies, these thinkers embraced the tenets of intellectualism and moral realism associated with Plato's philosophy. In addition, they emphasized a rational defence of the existence and providence of God, and an understanding of Christianity that transcended sectarian differences. On both fronts, their main targets were the materialism and atheism which they associated with the writings of Hobbes and the Epicurean revival. Here we focus on the views of the two most prominent members of the group, Ralph Cudworth and Henry More.

Cudworth published only one major work during his lifetime, the massive *True Intellectual System of the Universe* (1678), the subtitle of which reads: 'The First Part, wherein all the Reason and Philosophy of Atheism is Confuted; and its Impossibility Demonstrated'. In addition, he left a large body of unpublished writings, including *A Treatise Concerning Eternal and Immutable Morality*, which was begun in the early 1660s but did not appear in print until 1731, and *A Treatise of Freewill*, which was not recovered until the nineteenth century.<sup>19</sup>

Cudworth defends a conception of morality diametrically opposed to that of Hobbes. His primary objection to Hobbes' philosophy is its implication that good and evil are merely expressions of appetite and aversion, or that they depend upon the commands of a sovereign. Whatever is truly good or evil, Cudworth contends, must be so in virtue of the nature of the object in question: 'moral good and evil, just and unjust, honest and dishonest ... cannot possibly be arbitrary things, made by will without nature; because it is universally true, that things are what they are, not by will but by nature' (EIM: 16).



Cudworth's main reason for holding that things deemed good and evil are so by nature, and not merely by will, is that only in this way do we have an adequate account of moral obligation. If an action is morally good (or evil), then an agent is obliged to perform (or omit) that action because of the kind of action it is and not simply because of the benefits or harms associated with it: 'things called naturally good and due are such things as the intellectual nature obliges to immediately, absolutely, and perpetually, and upon no condition of any voluntary action that may be done or omitted intervening' (EIM: 20). What Cudworth is chiefly impressed by, then, are the demands that morality imposes on a rational agent. The demand that a certain action be performed *because* it is just, or avoided *because* it is (p. 427) unjust, is of the essence of morality, and in Cudworth's view such a demand cannot be accounted for unless certain kinds of actions are, by nature, good or evil.

In defending good and evil as natural properties of things, Cudworth is clear that he is not referring to the properties of external bodies. Moral good and evil are properties that belong by nature only to intellectual beings. Thus, the distinction of good and evil must arise from 'a certain inward determination in the soul itself' (EIM: 145). Cudworth further argues that because morality is inherently practical, in that it places demands on action, the soul cannot be conceived as a merely passive being, on which is imprinted knowledge of the truths of morality. Instead, morality must be grounded in the soul's nature as 'an innate active principle'. The 'anticipations of morality' spring from an 'inward and vital principle, in intellectual beings as such, whereby they have a natural determination in them to do some things and to avoid others, which could not be if they were mere naked passive things' (EIM: 145). On Cudworth's account, the ground of the distinction between moral good and moral evil is a rational being's capacity to judge that a certain form of action ought to be done or avoided, and its disposition to act in accordance with its judgements of right and wrong.

Saying just this, however, leaves undetermined the standard according to which such judgements are to be made. Granted, 'morally good' and 'morally evil' are predicated of inherent tendencies of the soul that reflect its knowledge of good and evil and its disposition to act on that knowledge. But by what standard is the soul able to judge actions as meeting, or failing to meet, the requirements of morality? Incorporating appeals to Plato and the Bible, Cudworth argues that the nature of good is identical to the nature of God, and consists fundamentally in love or charity. Hence, to be morally good, or virtuous, is not merely to obey God's commands, but to emulate God, the source of all goodness, in our actions (TIS: 205).

Cudworth's defence of the 'eternal and immutable' nature of morality is closely bound up with the metaphysics of Christian Platonism. Morality has the importance it does for us because the souls of intellectual beings are created bearing an inherent tendency towards God that is also the ground of their ultimate happiness: 'the soul of man hath in it ... a certain vaticination, presage, scent, and odour of one *summum bonum*, one supreme highest good transcending all others, without which, they will be all ineffectual as to complete happiness' (EIM: 174). God acts on all things constantly, drawing them back to him, and this activity is expressed in the capacity of intellectual beings to understand what they should do and to desire such actions for their own sake: '[T]his love and desire of good, as good in general, and of happiness ... is not a mere passion ... but a settled resolved principle, and the very source, and fountain, and centre of life' (EIM: 174). Accordingly, it is a mark of perfection for human beings to seek their greatest happiness in continued movement towards God.

(p. 428) The ethical theory of Henry More, presented in his *Enchiridion Ethicum* (1666), reflects many of the same concerns as that of his colleague Cudworth.<sup>20</sup> Like Cudworth, More takes morality to consist of 'eternal and immutable' truths concerning good and evil. He goes beyond Cudworth, however, in developing a theory, modelled on Euclid's *Elements*, in which such truths can be demonstrated in geometrical fashion. The work begins with 23 'moral noemata', or axioms, 'into which almost all the Reasons of Morality may be reduced' (More 1930: 20–1). These range from definitions of good and evil to the rule that it is good or just to give each person his due, but that a person may nonetheless forfeit what belongs to him based on his actions. From these principles, More claims to deduce all the 'duties we owe to ourselves', embodied in the virtues of prudence, temperance, and fortitude, and the duties we owe to others—to God, man, and virtue itself—embodied in the virtues of sincerity, justice, gratitude, mercy, and piety (1930: 24–5).

More's extended treatment of the topic of virtue gives his *Enchiridion* the appearance of a classical ethical treatise. He discusses the nature of virtue as the intellectual power of right reason, the role of the passions, the division of the virtues into

the self-directed and other-directed (and these in turn into the primitive and derivative), and the relation of external goods to virtue. Further, he frames his account against the backdrop of a broadly eudaimonistic conception of ethics. More defines 'Ethicks or Morals' as 'the Art of Living well and happily' (1930: 1). To live well is to perfect one's nature through virtue; to live happily requires both this and the favour of good fortune, on which depend those goods that lie outside our power.

Since we lack a full presentation of Cudworth's ethics, we cannot say with assurance how far More's views diverge from his. On one crucial issue, however, More's theory seems to point in a different direction. More explicitly relates ethics to the pursuit of happiness, which he defines as a kind of pleasure: 'Happiness is that pleasure which the mind takes in from a Sense of Virtue, and a Conscience of Well-doing; and of conforming in all things to the Rules of both' (1930: 4). As all writers on the topic do, More distinguishes the relevant pleasure as a pleasure of the mind; yet he unambiguously reduces the final end of happiness to pleasure itself and not the operations of the mind on which that pleasure supervenes. 'It is plain', he writes, 'that each Creature hath its own particular Pleasure, which is construed to be its supreme Happiness. Whence we may infer, That human Happiness does also consist in human Pleasure; but such, I mean, as ariseth from the Sense of Virtue' (1930: 5).

(p. 429) More grounds the capacity of human beings to achieve their end in what he calls the 'Boniform Faculty of the Soul': a faculty of 'that divine Composition, and supernatural Texture, as enables us to distinguish not only what is simply and absolutely the best, but to relish it, and to have pleasure in that alone' (1930: 6). Through this faculty, he says, 'we are lifted up and cleave unto God' and in this consists 'not only the highest Wisdom, but the highest Felicity' (1930: 28). As with Cudworth, the apex of human perfection presupposes our knowledge that in virtue there is manifest 'a thing Divine, and God's true Image'; thus, to be virtuous is to affirm the similitude of our rational nature to the 'great Original' (1930: 118). For More, however, this state of perfection is also, through the boniform faculty, endowed with an essential affective component. The happiness we find in God is a kind of pleasure, and this pleasure More identifies as our final end.

Although More remains, like Cudworth, a critic of Epicureanism for its materialism and imputed atheism, he comes close to affirming a type of hedonism. By definition, happiness is 'the pleasure which the mind enjoys from a sense of virtue' (1930: 8). While human perfection consists in virtue, which we value for its own sake, we are drawn towards virtue because of the pleasure it promises. If virtue were not experienced in this way, More conjectures, we 'would prosecute it so faintly, as never to obtain it' (1930: 9). Thus, while More is not a value hedonist who identifies the good with pleasure, he exhibits a strong affinity with psychological hedonists who explain our motivation for virtue in terms of the pleasing affects associated with it.

## 18.4 Cumberland

Richard Cumberland composed his *Treatise on the Law of Nature* (1672) as a refutation of Hobbes' philosophy, which he regarded as extending the pernicious influence of Epicureanism. His aim, he says in the introduction to the book, is 'to demolish the foundations' of Hobbes' mistakes, which have 'so grosly perverted so many'. Hobbes' doctrines, he maintains, 'are diametrically opposite, not to Religion only, but to all civil Society' (TLN: 283–4), and in this they are more dangerous even than those of 'his Master Epicurus' (TLN: 684).<sup>21</sup>

(p. 430) Among the 'wicked doctrines' that Cumberland seeks to confute is the idea that 'the virtues and their rules, the laws of nature', are to be understood merely as conditions of peace, 'or of finishing a certain War of every Man against every Man'. Against this, he cites as 'far more excellent' the view of 'the antient Philosophers' who taught that the virtues are 'to be cultivated as Means necessary to Happiness, the constant Aim of all Men' (TLN: 592). Whether Cumberland has Hobbes right on this point, the fact remains that the two philosophers operate with fundamentally different notions of happiness. Whereas Hobbes defines 'felicity' as 'a continual progress of the desire' (Hobbes 1994: 11.1), allowing that this implies that the circumstances of happiness vary widely from individual to individual depending on the content of their desires, Cumberland holds that the greatest happiness comes through the perfection of our natural faculties and the reward



that awaits us in a life after death. The ‘true and intire Happiness’ of human beings ‘comprehends all the attainable Perfections both of Mind and Body, and extends it-self, not to the present Life only, but to that which is to come, as far as it may be known by the Light of Nature’ (TLN: 603).<sup>22</sup>

Underlying this difference in what they say about happiness are different accounts of the good. Cumberland strongly objects to Hobbes’ explanation of the good in terms of desire. Picking up on the same point stressed by Cudworth, he argues that we do not judge things good because they are desired; rather, we desire them because they are good. By definition, the good ‘is that which preserves, or enlarges and perfects, the Faculties of any one Thing, or of several’ (TLN: 462). Expanding on this definition, Cumberland further distinguishes private good and public good, based on whether the good profits one or many; however, in both cases an object is judged good because it ‘truly helps nature’, and ‘*not* because it is *desir’d* from *Opinion*, whether true or false; or *delights*, for this or that Moment of time’ (TLN: 466).

Drawing together these points, we find in Cumberland a position that echoes that of the Cambridge Platonists. Against Hobbes, he stresses that the goodness of an object is an objective property of it, which is explained by the contribution it makes to the perfection of an agent’s powers and thereby provides the agent with a reason to seek it. Where Cumberland goes beyond the Cambridge Platonists is in developing a unified theory of virtue and happiness that ties these goods to an innate disposition for universal benevolence, or desire for the common good. Cudworth also had stressed the close connection between virtue and benevolence, but on his account virtue consists in our disposition to emulate God, whose nature is love or charity. Cumberland, by contrast, argues that while benevolence is indeed the paradigm of virtuous action as judged from the standpoint of God, it also can be understood as prudential from the standpoint of an individual agent. Although (p. 431) it may sometimes happen that ‘some particular person may obtain for a time some greater Advantages, than what are consistent with the Common Good’, nevertheless, ‘[i]f the whole course of Existence be taken into consideration, greater Happiness may be obtain’d by neglecting those Advantages, than by pursuing them’ (TLN: 604). In fact, we enjoy our greatest happiness in so far as we cultivate our capacity for virtue by acting on behalf of the common good.

Cumberland cites a variety of considerations in support of this conclusion. Most importantly, the happiness of a human being consists in the fullest expression of her rational powers, and this includes acting for the sake of what are understood to be the best ends. However, ‘the greatest and most excellent Object we can imploy ourselves about’ is ‘the Common Good of God and Man’ (TLN: 523). The common good unites the happiness of all and hence represents the greatest aggregate perfection. Thus, in promoting the common good, we act for the sake of the best possible end and thereby realize our own greatest perfection and happiness. Furthermore, when we act in this way, we take the greatest satisfaction, or pleasure, in our actions. This follows both from the nature of the actions themselves—‘the free exercise of the Virtues’ is naturally pleasing to the mind—and from our expectation that ‘virtuous Actions have a Reward annex’d to ’em by the Will of the First Cause’ (TLN: 598).

The last point introduces what Cumberland regards as the most important feature of his position: its uniting of virtue and happiness through the necessity of natural law.<sup>23</sup> Cumberland defines the ‘law of nature’ as:

a Proposition, proposed to the Observation of, or impress’d upon, the Mind, with sufficient Clearness, by the Nature of Things, from the Will of the first Cause, which points out that possible Action of a rational Agent, which will chiefly promote the common Good, and by which only the intire Happiness of particular Persons can be obtain’d. (TLN: 495–6)

As Cumberland conceives them, laws of nature direct us to perform those actions that promote the common good and their observance is associated with reward and punishment by God, on which our ‘intire Happiness’ depends. Framed in this way, it might seem that the force of such laws is wholly prudential: if we believe that virtuous action is rewarded and wicked action punished by God, then we will be disposed to act in the way dictated by the law out of concern for our future happiness. Cumberland contends, however, that there is also a genuine obligation associated with the law, on the basis of which we act wrongly, and thus are justly punished, if we do not obey its dictate. His argument for this conclusion rests on

the relation he posits between God's providential plan for creation and the capacity (p. 432) of rational beings to understand that plan, and hence God's intentions towards them:

The supreme Governor of the World, or First Rational Cause, by whose Will things are so dispos'd, that it is with sufficient clearness discover'd to Men, that some Actions of theirs are necessary Means to an End, which nature determines to pursue, wills, that Men should be oblig'd to those Actions, or he commands those Actions. (TLN: 603)

According to Cumberland, human beings are capable of discerning by reason that the pursuit of the common good is a necessary means to an end necessary to them, namely, their own happiness. Hence they recognize that it is not just in their interest to act benevolently, but that God intends them to act in this way, that is, it is God's will that they *should* act in this way. Consequently, they are 'oblig'd to this Pursuit, or to such actions as flow from thence: That is, [God] enjoins Universal Benevolence, which is the Sum of the Laws of Nature' (TLN: 603).

Although happiness is closely entwined with the rational pursuit of the good, it is not the source of our obligation to act on behalf of the common good. The obligation to act virtuously by honouring the content of the law of nature stems solely from the latter's being recognized as the will of God (TLN: 607). Granting this, Cumberland does not minimize the fact that in acting for the sake of the common good we are also acting for the sake of our own good and greatest happiness. Indeed, his principal claim is that, properly understood, these two ends coincide perfectly: to act for the sake of one is just to act for the sake of the other (TLN: 520–1).

The errors that vitiate Hobbes' philosophy are traceable, in Cumberland's view, to Hobbes' failure to recognize this basic point: that we best promote our own well-being by acting for the sake of the well-being of others. As Cumberland reads him, Hobbes is committed to the position that whatever men do, they do solely in pursuit of their own advantage; consequently, whatever regard they show for the good of others, for example, by respecting the demands of justice, they do only in so far as they are motivated by fear. Here he sees a close connection between Hobbes and Epicurus, who 'places the *chief Pleasure*, (which with him is the chief Good and End,) in the *absence of Pain*' (TLN: 590). Going no further than the evidence of experience, and the affections common to animals and humans, both philosophers limit their accounts of motivation and value to the avoidance of pain and the satisfaction of desire. As a result, they lack a conception of the good proper to a rational being. Against them, Cumberland aligns himself with 'all other philosophers', who believe 'that we are to take an Estimate of the *Nature of Man*, rather from *Reason*', and that the proper object of the will is whatever 'Reason dictates to be agreeable to the Nature of any Person'. From this perspective, philosophers ascribe value to '*whatever* conduces to the Preservation and Perfection, to the Order and Beauty of Mankind, or even of the whole Universe, as far as we have any Conception of it; *that* they think Good, *that* they will and desire, *that* (p. 433) they hope for, for the future, and rejoice in, when present' (TLN: 471–2). So it is with Cumberland, who identifies the perfection and happiness of a rational agent with the agent's will to promote the perfection and happiness of humanity as a whole.

## 18.5 Locke

For the Cambridge Platonists and Cumberland, the most repugnant feature of Hobbes' ethics is its rejection of a substantive conception of the human good. This good, associated with the perfection of an agent's powers of intellection and volition, is the condition of virtue that is the rightful source of a human being's happiness, in which she most fully emulates the perfection of God. Hobbes, by reducing virtue to the disposition to act in ways that promote peace and minimize fear (especially the fear of death), rejects traditional perfectionist notions of the good. For Hobbes, there is simply the fact of desire, whose satisfaction is pleasing to us, and the fact that, in the absence of a commonwealth, the desires of human beings are invariably in conflict with one another. The inadequacy of Hobbes' position, in the eyes of his critics, can be traced to the inadequacy of his starting points: his materialism and hedonism—the latter evidenced in Hobbes' explaining good and evil in terms of appetite and aversion, which themselves are understood in terms of what is pleasing or displeasing to an agent.

In John Locke we find a different response to contemporary developments in moral philosophy. Although Locke does not offer a systematic presentation of his ethical theory, what he says in the *Essay* reveals how deeply hedonism runs in his thought and how closely he comes to mirroring views of Gassendi and Hobbes. While Locke upholds the ideal of a life proper to a rational being—one responsive to the dictates of divine law—the structure of his theory is at every point informed by hedonist principles.<sup>24</sup>

Locke leaves no doubt about his commitment to value hedonism: ‘what has an aptness to produce Pleasure in us, is that we call *Good*, and what is apt to produce Pain in us, we call *Evil*, for no other reason, but for its aptness to produce Pleasure and Pain in us’ (*Essay* II. xxi. 42; cf. II. xx. 2; II. xxviii. 5). Locke does not, strictly (p. 434) speaking, define good as pleasure, and evil as pain, but he proposes that the terms ‘good’ and ‘evil’ are meaningfully used to designate those things that are apt to produce pleasure or pain in us, for no other reason than that we are responsive to them in this way.

Locke is also, arguably, an ethical hedonist who believes that the best life for a human being is one in which we enjoy the greatest pleasure available to us. He asserts that the desire for happiness is necessary to any human being (*Essay* I. iii. 3; II. xxi. 43), and that happiness is nothing but an enduring state of pleasure (or the absence of pain), which we desire for its own sake: ‘*Happiness* then in its full extent is the utmost Pleasure we are capable of, and *Misery* the utmost Pain: And the lowest degree of what can be called *Happiness*, is so much ease from all Pain, and so much present Pleasure, as without which any one cannot be content’ (*Essay* II. xxi. 42).

Locke rejects the ancients’ search for the *summum bonum* on the grounds that it presupposes a unique answer to the question of the content of happiness, that is, whether it consists in riches, or bodily pleasure, or virtue, or contemplation. He denies that there is any effective way to settle the happiness question in these terms: ‘they [the ancients] might have as reasonably disputed, whether the best Relish were to be found in Apples, Plumbs, or Nuts; and have divided themselves into Sects upon it’ (*Essay* II. xxi. 55). Nevertheless, Locke defends a univocal account of the form that happiness takes in any human being:

So the greatest Happiness consists, in the having those things, which produce the greatest Pleasure; and in the absence of those, which cause any disturbance, any pain. Now these, to different Men, are very different things ... This, I think, may serve to shew us the Reason, why, though all Men’s desires tend to Happiness, yet they are not moved by the same Object. Men may chuse different things, and yet all chuse right. (*Essay* II. xxi. 55)

The structure of Locke’s account points unmistakably towards a relativism about the grounds of happiness, a position that would align him with Hobbes. This, he concedes, would be the correct conclusion to draw, if ‘Men in this Life only have hope’, or ‘if there be no Prospect beyond the Grave’ (*Essay* II. xxi. 55). Yet Locke invests his own account of happiness with a greater scope than this. The ‘true and solid happiness’, or ‘real Bliss’, which is ‘our greatest good’ (*Essay* II. xxi. 51–2), consists not in the variable and inconstant pleasures of this life, but in a ‘perfect durable Happiness’ that is promised in a life after death. Thus, a common standard is introduced for assessing the actions of human beings: the ‘prospect of the different State of perfect Happiness or Misery, that attends all Men after this Life, depending on their Behaviour here’ (*Essay* II. xxi. 60). According to Locke, it is this end of ‘true felicity’ that must guide our actions. For intellectual beings like ourselves, ‘the inclination, and tendency of their nature to happiness is an obligation’ which informs all of our deliberate actions (*Essay* II. xxi. 52).

(p. 435) Locke’s original position, presented in the first edition of the *Essay* (1690), was that human action can be explained in terms of the will’s determination by the greatest apparent good. An immediate objection to this account is that it seems to rule out the possibility of weakness of the will: the situation in which an agent recognizes a certain course of action as the best and decides to pursue it, yet is swayed from that decision by some more pressing want. In response to this objection, Locke revised his position in the second and subsequent editions of the *Essay*, attributing the immediate cause of action not to the mere representation of an object or end as good but to the *uneasiness* felt on representing the absence of some good: ‘This *Uneasiness* we may call, as it is, *Desire*; which is an *uneasiness* of the Mind for want of some absent good. All pain of the body of what sort soever, and disquiet of the mind, is *uneasiness*: And with this is always join’d Desire, equal to the

pain or *uneasiness* felt; and is scarce distinguishable from it' (*Essay* II. xxi. 31).<sup>25</sup>

Locke's revised theory is a form of psychological hedonism: we are motivated to act by the pain, or uneasiness, we feel on perceiving the absence of some good, which uneasiness is the source of desire. He further makes two important claims about the relation among our desires. First, the will is 'ordinarily' determined by the 'most pressing' uneasiness that is judged capable of being removed (*Essay* II. xxi. 40). Second, in addition to the 'sundry uneasinesses' that press upon us at any moment, there is also the 'constant desire of Happiness' (*Essay* II. xxi. 50)—that is, the desire for some degree of contentment in the balance of pleasure and pain we experience, or the desire for the ultimate happiness promised in a life after death. In general, Locke believes, the first of these claims supports the second: 'the present *uneasiness*, that we are under, does naturally determine the will, in order to that happiness which we all aim at in all our actions' (*Essay* II. xxi. 36). Yet this is not inevitably the case: we may on occasion be moved by a pressing desire for pleasure or the avoidance of pain that is at odds with the pursuit of 'true and solid happiness' (*Essay* II. xxi. 50). Thus, we may act contrary to what we recognize to be our greatest good.

Locke addresses this problem through another revision of his position. 'Ordinarily' the will is determined by the 'most pressing desire'. In addition, however, we have the power to 'suspend' our desire, allowing ourselves time to reflect on whether it is indeed an effective means to our happiness—a reflection that may alter the force of the original desire. For Locke, adept agents cultivate the power of suspending desire, which provides an 'opportunity to examine, view, and judge, of the good or evil of what we are going to do'. Thereafter, it is 'not a fault, but a perfection of our nature' to act from the desires resulting from this examination (*Essay* II. xxi. 47).

(p. 436) The doctrine of suspension of desire is closely connected with Locke's explanation of morality. Morality, in general, for him consists of a set of rules or laws enforced by the expectation of appropriate reward or punishment. Of these laws, he distinguishes three kinds: (i) divine law; (ii) civil law; (iii) the law of 'opinion or reputation', which he identifies with virtue and vice (*Essay* II. xxviii. 6–7). Locke's linking of virtue and vice to 'the law of reputation', or as he elsewhere puts it, 'The Law of Fashion, or private Censure' (*Essay* II. xxviii. 13), raised the ire of later critics such as Shaftesbury, who objected to the relativism that Locke takes to attend judgements about the propriety of manners or customs (*Essay* II. xxviii. 10–11). His willingness to entertain such relativism about virtue and vice, however, implies no laxness on his part regarding the standards of moral rectitude. Indeed, Locke reinforces the absoluteness of such standards, grounded in divine law, by distinguishing them from rules that are supported only by custom and the power of the state. In general, he believes, judgements of virtue and vice do 'in a great measure every-where correspond with the unchangeable Rule of Right and Wrong, which the Law of God hath established' (*Essay* II. xxviii. 11). However, where these two sets of rules diverge, it is divine law, the 'Law which God has set to the actions of Men, whether promulgated to them by the light of Nature, or the voice of Revelation' (*Essay* II. xxviii. 8), which dictates how they should act. Locke's doctrine of natural law—divine law promulgated to human beings by the 'light of Nature'—has been criticized on several counts.<sup>26</sup> One objection targets his account of our knowledge of natural law. This is a pressing concern given Locke's rejection of innate practical principles, the prevalent explanation of how we come to have knowledge of morality (*Essay* I. iii. 1–2). Locke envisions moral notions as constructed from simple ideas of sensation and reflection (*Essay* II. xxii. 12), and in the *Essay* he notoriously claims that because of this the principles of natural law can be demonstrated with geometrical certainty (*Essay* III. xi. 16; IV. iii. 18–20). Locke himself may ultimately have drawn back from a strong version of this thesis. It does not follow, however, that he abandoned the idea of the rational justification of morality. His account of moral knowledge is consistent with the epistemic stance he adopts throughout the *Essay*: God has given human beings the ability to reason their way to the knowledge they require for happiness, where this includes 'Light enough to lead them to the Knowledge of their Maker, and the sight of their own Duties' (*Essay* I. i. 5). To this extent, moral knowledge is supported by reason, but it is not necessary that it meet the standard of demonstrative certainty (Tuckness 1999: 81–2).

A second issue on which Locke has been challenged concerns the consistency of his account of moral obligation and his psychological hedonism. Here it is essential to distinguish the origin of the obligation associated with natural law and our (p. 437) motivation to comply with it. For Locke, the obligatory force of law rests with the authority of the lawgiver. What

makes natural law ‘law’ is that God commands it. Although it is true that to recognize the obligation created by such laws I must understand the relation in which I stand to God, that understanding does not determine the obligation. It is a function solely of the fact that the law is the command of a rightful superior, with an unlimited power to reward and punish (*Essay II. xxviii. 8*).

The existence of such an obligation by itself, however, does not explain why human beings are motivated to comply with it. Locke marks this point by distinguishing the ‘moral rectitude’ of an action, which is determined solely by its lawfulness, and an action’s being morally good or morally evil. Morally good (or evil) actions are voluntary actions that conform (or fail to conform) to the will of the lawgiver; but it is not their conformity as such that renders them good or evil from the perspective of an agent. Rather, it is the reward or punishment that such actions are apt to receive from a lawgiver powerful enough to dispense it (*Essay II. xxviii. 5*). Thus, Locke writes, by comparing them to the requirements of divine law, ‘Men judge of the most considerable *Moral Good or Evil* of their Actions; that is, whether as *Duties, or Sins*, they are like to procure them happiness, or misery, from the hands of the ALMIGHTY’ (*Essay II. xxviii. 8*).

Recognizing the dictates of divine law for what they are—rules of action commanded by an all-powerful creator—human beings can judge the consequences of obedience or disobedience for the overarching goal of happiness. Desiring happiness, and believing that their ultimate happiness or misery lies in the hands of God, they can choose to regulate their actions according to the standards of divine law. In doing so, they rely on their power to suspend desire until they have ascertained whether the proposed action is consistent with their ‘real happiness’ (*Essay II. xxi. 51*). Locke describes the ‘careful and constant pursuit of true and solid happiness’ as ‘the highest perfection of intellectual nature’ (*Essay II. xxi. 51*). In a sense, this is correct: given the complement of desires and powers with which rational beings are endowed, they can do no better than to regulate their desires in accordance with the final goal of happiness. Yet the perfection of intellectual nature is not for Locke a measure of the human good, any more than virtue is. His account of the good remains hedonistic: human beings ascribe value to whatever is apt to produce pleasure in them, and for Christians at least, the ultimate realization of this value is the eternal happiness promised to those who obey God’s law.<sup>27</sup>

## (p. 438) 18.6 Conclusion

Despite the preponderance of opinion against Epicureanism in seventeenth-century Britain, many of the major contributors to moral philosophy registered its significance by directing criticisms against it or by incorporating, sometimes unconsciously, elements of hedonism into their theories. The development of moral philosophy during the period reveals the growing place assigned to the concept of pleasure in accounts of motivation and value. In addition to the direct mediation of Epicureanism through the writings of Gassendi, the philosophies of Hobbes and Locke constitute wide-ranging attempts to ground ethical theory in a human beings’ natural affective responsiveness to its environment (desire and aversion, pleasure and pain). Even among philosophers who present themselves as opponents of Epicureanism, such as More and Cumberland, there is an acknowledgement that the final end of action—happiness—is to be construed at least partly in hedonistic terms. All human beings desire happiness and act for the sake of it, because they desire pleasure, although they are often guilty of confounding the character and requirements of ‘true happiness’ with the immediate satisfaction of desire.

A fundamental criticism of hedonism, stressed already by its ancient critics, is that it is incompatible with a robust commitment to virtue. Acting only for the sake of pleasure, the hedonist will inevitably fail to give sufficient weight to the demands of right action, particularly when it requires sacrificing one’s own advantage for that of another. Standing in strongest opposition to the Epicurean position is Cudworth, who identifies the good with the perfection of our rational nature as manifested in a virtuous character, one that is disposed to perform morally good actions for their own sake. Cudworth’s perfectionism is extended by Cumberland, who equates virtue with benevolence: a will that aims always for the common good, identifying itself with the universal charity of God. For Cumberland, a human being who is disposed to act for the sake of the common good also thereby realizes her own good and enjoys the greatest happiness, since virtuous action itself is pleasurable and meritorious in the eyes of God. Thus, in the end, there is no real conflict between virtue and pleasure,



properly understood.

As judged by his critics, Hobbes' rejection of traditional notions of virtue and the good constitute an affront to religion and a dangerous weakening of the bonds of society. Hobbes identifies the moral virtues with the means to 'peaceable, sociable, and comfortable living'; however, he stresses that such qualities by themselves are insufficient to overcome the natural sources of conflict among human beings, (p. 439) including conflict about the ultimate grounds of value. Consequently, the peace and security of a society can be achieved only through the imposition of law by an absolute sovereign. Locke retraces, to a greater extent than he is prepared to acknowledge, the steps taken by Hobbes, yet stops short of the political conclusion his predecessor draws. For Locke, notions of virtue and vice reflect the conventional norms and customs of a people and so may vary widely across places and times. Underlying these diverging notions of right and wrong, however, is an unchanging law, known through reason and commanded by God, which represents the standard of 'moral rectitude'. Locke believes human beings can be brought to recognize the force of this law by understanding how observance of it bears upon their ultimate happiness: obey the law and enjoy lasting bliss; disobey it and suffer lasting misery.

Later philosophers such as Shaftesbury understandably found Locke's position inadequate. While identifying virtue and vice with conventional standards of propriety, Locke offers no convincing explanation of why we are bound to adhere to the requirements of morality. The prospect of future reward or punishment is simply not strong enough to sustain, and explain, a commitment to moral virtue.<sup>28</sup> Shaftesbury's response is to invoke, much like Cumberland, the idea of a divinely ordered harmony among all rational beings, and to link the motive of virtue to the pleasure we take in feeling ourselves part of this whole. Because our own best state results from acting in a way that is harmonious with the whole—that is, acting virtuously—virtue obligates without having to be commanded by an external authority. Thus, it is not merely from the promise of future reward or punishment that we are drawn to virtue; our best life and present happiness depend upon it.<sup>29</sup> Shaftesbury's account goes beyond Cumberland's in setting aside the notion of natural law as necessary for morality. Instead, moral obligation arises through recognizing the authority of one's own 'better self'—a self whose directives are determined through the operation of 'moral sense'.<sup>30</sup>

Shaftesbury's position is but one response to the debates concerning hedonism and virtue that animate seventeenth-century British moral philosophy. Yet it is a position that entrenches the central place of pleasure, or more broadly affective responsiveness, in ethical theorizing—a trend that continues in the eighteenth century with Hutcheson, Smith, and Hume.<sup>31</sup>

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## Notes:

(1) For succinct surveys of natural law theory, highlighting the differences between intellectualist and voluntarist versions of it, see Haakonssen 1996: ch. 1 and Schneewind 1998: ch. 2.

(2) Hooker defines natural law as 'a directive rule unto goodness of operation' (1989: 77). In human beings, this is specified

in terms of the proper operation of reason and will: 'Reason is the director of man's will by discovering in action what is good. For the laws of well-doing are the dictates of right reason' (1989: 72).

(3) For further discussion of Grotius' innovations, see Schneewind 1998: 66–81. Schneewind identifies the 'Grotian problematic' as the crucial turning point in the development of modern moral philosophy.

(4) Jones 1989 offers a helpful summary of historical attitudes towards Epicureanism.

(5) *On Duties*, III.118, in Cicero 1991: 146.

(6) See Jones 1989: ch. 7 and Sarasohn 1996. For a recent, broad engagement with the topic, see Wilson 2008.

(7) As Michael and Michael (1995) emphasize, it is important to distinguish Gassendi's views from those of Epicurus. The former include Aristotelian, Stoic, and Christian elements foreign to Epicureanism, and these undoubtedly helped to make Gassendi's writings more palatable to contemporary readers. On this point, see also Johnson 2003.

(8) Stanley's *History* appeared in three volumes between 1655 and 1660. His presentation of Epicurus' views appears in the third volume. Stanley 2006 reprints the third edition of 1701.

(9) The body of *Epicurus' Morals* is a translation of Part Three of Gassendi's *Philosophiae Epicuri Syntagma* (1649), and is prefaced by Charleton's own 'Apologie for Epicurus'. See Charleton 1926.

(10) On Hobbes' relations with Gassendi, see Sarasohn 1996: ch. 5; Paganini 2001.

(11) *De homine*, 11.4, in Hobbes 1991: 47.

(12) *De homine*, 11.5, in Hobbes 1991: 47.

(13) *DCo* 25.12; *OL* 1: 332.

(14) *De homine*, 11.2; *OL* 2: 95.

(15) Hobbes explains his notion of 'felicity' in Hobbes 1994: 6.58 and 11.1. For an argument that the desire for happiness remains central to Hobbes' ethics, see Rutherford 2003.

(16) For an entry point to the literature, see Darwall 1995: ch. 3.

(17) Although Hobbes reserves space for a construal of the laws of nature as laws commanded by God, he regards such laws as authoritative only for those who profess belief in a providential creator. They do not govern the actions of 'atheists, nor they that believe not that God has any care of the actions of mankind (because they acknowledge no word for his, nor have hope of his rewards, or fear of his threatenings)' (Hobbes 1994: 31.2).

(18) On the philosophy of the Cambridge Platonists, see Hutton 2002. On their targeting of Hobbes, see Mintz 1962.

(19) Both texts are found in EIM. For discussions of Cudworth's views, see Passmore 1951, Darwall 1995: ch. 5, and Gill 2006: ch. 4.

(20) There is evidence that More was familiar with Cudworth's unpublished writings, and that the latter chose not to publish his work after More's book appeared. See Passmore 1951: 15–16 and Gill 2006: 51–3. We cite the 1690 English translation of the *Enchiridion* reprinted in More 1930.

(21) The original Latin edition of Cumberland's book, *De legibus naturae disquisitio philosophica*, was published in 1672, and included as part of its subtitle: 'the Elements of Mr Hobbes' Philosophy, as well Moral as Civil, are consider'd and refuted'. A complete English translation by John Maxwell was published in 1727. We quote from the modern reprint edition

in Cumberland 2005 (TLN), omitting Maxwell's idiosyncratic use of quotation marks but retaining his italics and orthography. For a fuller discussion of Cumberland's views, see Schneewind 1998: ch. 6.

(22) While acknowledging that pleasure, as the sense of perfection, forms part of the content of happiness, Cumberland rejects the view (affirmed by More) that the two can be identified (TLN: 523).

(23) Haakonssen (2000: 46–7) argues that Cumberland's doctrine is distinguished by its subordination of the concept of virtue to that of law and its omission of any detailed classification of the virtues of the sort found in More.

(24) Locke has long been held to have been influenced by Gassendi. For a critique of this assumption, see Milton 2000. Although Locke (with one exception noted below) studiously avoids mention of Hobbes, on his first reading of the *Essay*, Newton accused him of Hobbist tendencies. For an interpretation of this charge, which links it to Locke's hedonism, see Rogers 1979: 199–200. Hedonism, in fact, is a relatively late addition to Locke's philosophy. The earliest manuscript evidence of its appearance is from 1676, five years after the A and B drafts of the *Essay*. See Locke 1954: 263–72.

(25) For more on Locke's revisions to his position, see Chappell 2007: 148–56.

(26) For a survey of these criticisms and a defence of Locke, see Tuckness 1999. Other useful discussions include Colman 1983, Schneewind 1998: ch. 8, and Wilson 2007.

(27) In the one passage in the *Essay* in which Locke refers explicitly to Hobbes, he offers a revealing contrast between his conception of morality and that of the 'old heathen philosophers': 'That Men should keep their Compacts, is certainly a great and undeniable Rule in Morality: But yet, if a Christian, who has the view of Happiness and Misery in another Life, be asked why a Man must keep his Word, he will give this as a *Reason*: Because God, who has the Power of eternal Life and Death, requires it of us. But if an *Hobbist* be asked why; he will answer: Because the Publick requires it, and the *Leviathan* will punish you, if you do not. And if one of the old *Heathen* Philosophers had been asked, he would have answer'd: Because it was dishonest, below the Dignity of a Man, and opposite to Vertue, the highest Perfection of humane Nature, to do otherwise' (*Essay* I. iii. 5). See also II. xxi. 70.

(28) *Inquiry concerning Virtue or Merit*, book I, part I, sec. 3, in Shaftesbury 2001, vol. 2: 68–9.

(29) *The Moralists; a Philosophical Rhapsody*, part III, sec. 3, in Shaftesbury 2001, vol. 2: 434.

(30) Darwall (1995: 197–206) argues for Shaftesbury's importance as a thinker who combines moral sentimentalism with rational self-determination, the latter idea anticipating Kant's practical philosophy.

(31) On this trend, see in particular Gill 2006.

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## Passions and Affections

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## Abstract and Keywords

This chapter examines the views of seventeenth-century British philosophers on passions and affections. It explains that about 8,000 books published during this period mentioned passion and that it started with Thomas Wright's *Passions of the Mind in General*. The chapter also explores the intellectual basis of the writers who wrote about passion – which includes Augustinianism, Aristotelianism, stoicism, Epicureanism, and medicine – and furthermore, analyzes the relevant works of Francis Bacon, Thomas Hobbes, Henry More, and Lord Shaftesbury.

Keywords: passions, affections, British philosophers, Thomas Wright, Mind in General, Augustinianism, Aristotelianism, stoicism, Epicureanism, medicine

ALMOST every major British philosopher of the seventeenth century, as well as many a minor one, wrote extensively on the passions: Francis Bacon, Thomas Hobbes, Henry More, and Lord Shaftesbury incorporated them as basic elements in their psychology and ethics, and sometimes even their ontology. Only Locke appears to have had little to say about the passions, and his disregard may itself be philosophically significant. Yet curiously little philosophical secondary literature examines what were then dubbed ‘passions’ and ‘affections’, roughly coinciding with our ‘emotions’. This indifference contrasts sharply with the recent proliferation of intellectual histories of the passions during the general early modern period; whereas Descartes and Spinoza are popular subjects, and Hobbes is included in most surveys, other British authors rarely receive more than a mention.<sup>1</sup> Their neglect cannot be attributed to any shortage of material, whether in philosophy or in other fields. Restricting the scope to uncontroversially philosophical literature still leaves us with a mass of material and no obvious framework for understanding it. For not only is the period intellectually unsettled, discussions of the passions typically exist at the intersections of several philosophical sub-disciplines, without fitting fully in any.

(p. 443) Yet over eight thousand books published in English during the seventeenth century mention ‘passion’ in one or more places, and the count grows if we include ‘affection’.<sup>2</sup> Although not all of those works address the passions thematically, many do. Some are works of largely forgotten figures, but they nonetheless reward investigation, since they are typically erudite and informative, and often cast familiar patterns of early modern thought in a new light. What follows is an attempt to furnish a template for interpreting the hold the passions had on British philosophical thought of the seventeenth century. A noteworthy feature is the practical approach most authors adopt to the topic: the passions, they declare, are an inescapable part of human life, and often a salutary one, but also prone to excess, error, and misdirection. Such writers thus offer techniques of remediation and proper government to promote the ends of morality, happiness, health, civil peace, human management, and whatever else is part of human flourishing. In doing so, many also venture into ontology, philosophical psychology, and natural philosophy.

Preceded by such sixteenth-century works as Juan Luis Vives' *De anima et vita* (1538), and Timothy Bright's *Treatise of Melancholy* (1586), the century began with Thomas Wright's *Passions of the Mind in General* (1604, first edition 1601 as *The Passions of the Mind*).<sup>3</sup> Wright was a Jesuit, although with royalist allegiances, and his work showed the broad erudition typical of his time. Using a largely Aristotelian-scholastic framework informed by humanist learning, it aimed to show how to moderate 'inordinate passions'. At much the same time, Francis Bacon was at work on his *Essays* (first edition 1597, multiple subsequent editions), which treated particular passions and their management, along with lengthy discussions of the virtues, temperaments, and conditions that shape the dynamics of human life. His *Advancement of Learning* (1605), and even more, the Latin version *De dignitate et augmentis scientiarum* (1623), explained the importance of examining the passions and affections under the rubric of moral philosophy, and the 'culture of the mind' in general. Other works of interest appeared in the early decades, including Robert Burton's remarkable *Anatomy of Melancholy* (first edition 1621, multiple subsequent editions), which combined humanist learning and medical theory within a sometimes comic and often ironic framework, as well as the short play *Pathomachia, or the Battle of the Affections* (1630). In 1640, the Protestant divine Edward Reynolds published *A Treatise of the Passions and Faculties of the Soul of Man*, a bulky work offering another roughly Aristotelian-scholastic approach to the management of the passions. Reynolds was most concerned with the 'middle' passions distinctive to humans by their sensitivity to reason. He aimed to treat them in a (p. 444) 'moral' discourse, supplemented by 'natural' and 'civil' ones, to equip us with the self-knowledge to correct the errors of the passions. In 1644, Sir Kenelm Digby published *Two Treatises* in Paris; a London edition followed the next year. Both treatises discuss the passions, with the first offering a comprehensive account of physiology and philosophical psychology framed by Digby's own novel physical theory, which melded aspects of the mechanism coming into vogue with Aristotelian principles. Hobbes wrote no single work on the passions, but they figure in almost every general account he gave of the body, human being, and the state. Although his views changed over time, works such as the *Elements of Law* and *Leviathan* generally understood the passions in naturalist and materialist terms as a set of motions within the flux induced in the human body through interactions with its environment. The passions are the motions proximate to our voluntary actions, and as such, they constitute our motives, making them fundamental to both our psychology and political life.

English booksellers also published books from continental, particularly French authors, and there was a lively trade in the translations of major works. For this reason, as well as through personal contacts, French approaches to philosophical psychology and natural philosophy became increasingly important (see Brown 1996: 4), while the influence of Aristotelian accounts of the soul waned during the second half of the century, at least outside the universities (see Krayer 2002: 283; Brown 1996: 6; Rogers 1996: 46). Thomas Stanley's massive *History of Philosophy* (1655–1662) explicitly took the French atomist Pierre Gassendi as its model for discussing Plato, Aristotle, Zeno, and the Epicureans, with particular attention to their various understandings of passions and affections. An even more prominent devotee of neo-Epicureanism was the royal physician Walter Charleton, who published his *Natural History of the Passions* in 1674 (second edition 1701). The work as a whole endorsed an Epicurean ethical practice valorizing psychological tranquillity, although it relied just as heavily on Descartes' *Passions of the Soul* (1649) for its details. Descartes was also an important source for Henry More, whose *Enchiridion Ethicum* was published in 1668, and translated as *An Account of Virtue* in 1690. More lacked Charleton's interests in physiology and medicine, but borrowed extensively from Descartes to explain the role of the passions in achieving virtue and happiness.

Towards the close of the century, John Norris and Mary Astell (the latter anonymously) published their correspondence as *Letters Concerning the Love of God* (1695). This exchange began with Astell's querying the consequences of the occasionalist view Norris had adopted in his *Theory and Regulation of Love* (1688). Astell argued that Norris' position made God responsible for all our perceptions, even painful sensations and passions, and devalued love directed at our neighbours and fellows. The subsequent correspondence not only clarified Norris' views, it allowed them jointly to develop accounts of the nature of the passion of love, the relation between the love of God and the love of fellow humans, and the place of (p. 445) other virtues and pleasures. Yet another interlocutor joined the fray when Damaris Masham published her *Discourse Concerning the Love of God* (1696). But Masham took exception to the Malebranchian view that only God could be credited as the agent of our pleasures, and thus was the only proper object of love; indeed, she maintained that

rather than describing a passion central to human morality and happiness, the view promoted by Norris and Astell substituted a dangerous emphasis on the contemplative for the true virtues of the active life. Shortly thereafter, in 1699, Shaftesbury published an early version of the *Inquiry Concerning Virtue and Merit*, later incorporated into his *Characteristicks of Men, Manners, Opinions, Times* (1711). The passions and ‘affections’ were central to the work: as motives for the actions of sentient creatures, they form the focus of evaluative judgements. Those evaluations take on a genuinely moral character for creatures with the additional ability to reflect on and respond affectively to their own affections. Shaftesbury argued that properly moderated, our natural affections incline towards the public good, the touchstone of all judgements of worth. Since indulging our natural impulses is the surest path to happiness, he concluded that ‘virtue and interest may be found at last to agree’ (1999: 167). In taking this stance, Shaftesbury showed himself indebted to More, but his work was also a turning point, inaugurating the theories of moral sense and sentiments developed by such eighteenth-century philosophers as Francis Hutcheson, David Hume, and Adam Smith.

## 19.1 Terminology

In the early decades of the seventeenth century, talk of the passions surfaced most commonly in religious tracts, particularly sermons; other sources included medical treatises, works on rhetoric, plays, political texts, poetry, drama, pedagogical discourses, guides for self- and other-improvement, and even drawing manuals. Such works provide a kind of folk-theory of the passions that shaped the available vocabulary, all the more so since the boundaries between philosophy and other scholarly letters were not marked as they are now. The most common use of ‘passion’ in the first two decades of the century, however, was to refer to Christ’s passion, and by extension the sufferings of martyrs. This use waned over the course of the century, even in sermons. But a sense of the ancient usage from which it derived lingered: in keeping with its Latin etymology and ultimate derivation from the Greek *pathos*, ‘passion’ often simply meant the inverse of action, something undergone, or as *An English Expositor, or Complete Dictionary* put it, ‘a suffering’ (Bullokar 1680: n.p.; cf. Wright 1604: 7). Because activity takes ontological priority, (p. 446) passions were often considered imperfections or corruptions. In this sense, passions could be identified with disturbances, perturbations, and illness. But this use too lost ground over the century.

In many cases, ‘passion’ was used interchangeably with ‘affection’ (e.g. Wright 1604: 7–8; Reynolds 1640: 45; Stanley 1701: 590) to mean a modification, or changeable property induced in a thing, although ‘affection’ might cover any attribute of the body or soul. But ‘passion’ and ‘affection’ were commonly restricted to the ‘passions of the mind,’ understood as ‘motions in the soul’, a psychological sense that grew strongly in the second half of the century. They often referred particularly to affective states—those states understood to involve pain, pleasure, or some mental disturbance (Stanley 1701: 202). Sometimes they were restricted yet further: ‘affections’ to benevolent or amorous emotions, and ‘passions’ to vehement emotions, or the outbursts expressing them. Drawing from the associations with perturbation or illness gave ‘passion’ a flavour of violence and irrationality, even as it might also simply describe either the object of pursuit or the zeal of the pursuing. Although these senses came to supersede the earlier ones, they were not predominant in the seventeenth century. At the same time, familiar terms such as ‘emotion’ or ‘sentiment’ lacked their current meanings: ‘emotion’ did not name a general psychological category until the early nineteenth century, while the understanding of ‘sentiment’ as a feeling, opinion, or emotion showed up late in the seventeenth century and only spread in the eighteenth century.

## 19.2 Background and Context

Tracing how various authors drew from their intellectual roots can help guide us through the thicket of available concepts. Most of the works are littered with allusions to other writers: sometimes to display humanist credentials, as in Wright, Reynolds, and Burton; sometimes to pledge fealty to philosophical positions, as in Charleton, More, and later, Norris and Astell; and sometimes simply to identify a target for attack—as almost all authors did with the Stoics. What follows are only

the more obvious influences for deciphering the palimpsest of the texts.

### 19.2.1 Augustinianism

As in most other arenas of seventeenth-century life, religious doctrines shaped approaches to the passions, with original sin providing a ready explanation of why our passions stand in need of correction (Wright 1604: 2; Reynolds 1640: 44). One (p. 447) Calvinist catechism of the late sixteenth century indicted our passions as part of our corrupted state, requiring children to declare ‘the affections of the heart, as love, joy, hope, desire, etc., are moved and stirred to that which is evil to embrace it, and they are never stirred unto that which is good unless it be to eschew it’ (Perkins 1970: 151; see Gill 2006: 8). Yet despite the long shadow Calvinism cast over the first half of the century, none of the authors considered here issued blanket condemnations of the passions, even when seeking remedies for them. Instead, many cited Augustine with approval, whose temperate anti-Pelagianism allowed him to acknowledge our passions as fallen without denouncing them wholesale. Wright, Reynolds, and Burton all referred to Augustine (or ‘Austin’) repeatedly, and both Wright (1604: 15–17) and Reynolds (1640: 48–50) borrowed his criticisms of Stoic ideals of *apatheia*. Augustinian influence also grew as it was filtered through the French neo-Augustinians of the Congregation of the Oratory, such as Jean-François Senault, whose *De l’Usage des Passions* was translated in 1649 (reissued in 1671), followed by other works. Towards the end of the century, Norris and Astell relied heavily on the thought of Nicolas Malebranche; several translations of the *Search After Truth* appeared in 1694–5, and again in 1700. The Augustinian approach informed a number of defences for the passions: both the Jesuit Wright (1604: 13) and the conciliatory Protestant Reynolds claimed that only our corruption set the passions against reason, concluding that the passions are the ‘best servants, but the worst masters which our Nature can have’ (Reynolds 1640: 46). It also explains the focus of those authors who, like Senault, ‘embrace the opinion of Saint Augustine, and ... maintain with him, that love is the only passion which doth agitate us, or hath operation in us’ (1649: 26; cf. More, Norris and Astell). Norris and Astell later adopted Malebranche’s views to maintain that original sin has diverted our love from its proper object and mixed it with desire (1695: 48–9, 95). Astell particularly identifies ‘Misapplication and unsuitable Management’ of the passions as the source of emotional woe (1695: 130), for which the proper remedy is to cultivate a ‘regulated’ love for God.

### 19.2.2 Aristotelianism and the Schools

For all Augustine’s popularity, Aristotle’s philosophical and moral psychology remained a touchstone for almost all authors. Most writers in the first half of the century adopted the Aristotelian tripartite soul, which located the passions in the sensitive part, yet made them answerable to reason (e.g. Wright 1604: 46f; Reynolds 1640: 62; and in idiosyncratic fashion, Charleton 1701: 54–5). But the importance of the model diminished over the century: Norris suggested that use of the Aristotelian division had become a mere ‘popular mode of speaking’, which he rejected (1695: 110). Aristotle’s account of virtue as hitting a mean between extremes likewise informed the commonplace that moderation in the passions is desirable (p. 448) and excess to be avoided, although this too became something of a cliché. Most importantly, many authors (Wright 1604: 22; Burton 2001: 258; Reynolds 1640: 39–40; Senault 1649: [22]–3) took over the canonical list of eleven passions first formulated in Aristotle’s *Nicomachean Ethics*: love, hate, desire (concupiscence, coveting), aversion (flight), joy (delight, pleasure), sadness (grief, pain), hope, despair, fear, daring (audacity), anger (ire, indignation). Yet widespread influence did not preclude criticism (e.g. Reynolds 1640: 42). For instance, Henry More situated his account of virtue and happiness within Aristotle’s (1690: 4–10) and tried to assimilate Aristotle to his own notion of our ‘boniform faculty’ (1690: 16). At the same time, he criticized Aristotle for failing to grant the full worth of the passions (e.g. 1690: 18). In contrast, Bacon pretty much ignored Aristotle in his *Essays* (see Vickers 1996: 207), while Hobbes denounced Aristotle for spreading ‘darknesse from vain philosophy’ (Hobbes 1994a: 46.32), and dismissed the view that a ‘mediocrity’ of passions is desirable (Hobbes 1994b: 17.14; see also *Behemoth* in EW, 6: 218). Even so, both Hobbes and Bacon seem to have valued Aristotle’s *Rhetoric*.

### 19.2.3 Stoicism, Epicureanism, and their Critics

The Stoics came in for much censure for their supposedly sweeping dismissal of the passions in favour of ‘a *Stoical Apathy*’ (Astell 1695: 130; cf. *Pathomachia* 1630: 50; More 1690: 34; but contrast Wright 1604: 50). Although most treated



them simply as a group, a few authors singled out Cicero or Seneca. Burton cited the *Tusculan Disputations*' characterization of the passions as perturbations and disease (2001: 40), a view he exploited for 'melancholia'. Yet Burton also maintained that our dispositions for such diseases are part of our natural condition, so that only fools and Stoics are untroubled by passions (2001: 172). A few authors advanced criticisms of specific Stoic tenets: Bacon, for one, defended anger (SEH 6: 510), and Reynolds found the basis for their diagnosis of passions as '*Aegritudo Animi*, a sickness and Perturbation', in the Aristotelian view that motion involves some kind of imperfection (1640: 47, see also 59). In contrast to their 'senseless apathy', he defended the passions as good 'in act', a form of 'natural motion, ordained for the perfection and conservation of the Creature'.

But the Stoics did not figure merely as a target for defenders of the passions. Although 'senseless apathy' won few champions, the ideal of freedom from 'perturbation' held wide appeal as the goal for rehabilitating the passions. This conception came very close to the Epicurean ideal of *ataraxia* (see Kraye 1998: 1295, 1298), and many of the terms British authors favoured, such as 'quietness', or 'tranquillity', could express *apatheia* or *ataraxia* equally well (especially since *tranquillitas* was used by Latin authors to translate both Greek terms). Some authors also emphasized the importance of not being committed to what lies outside of our (p. 449) control (Charleton 1701: 175–9), an emphasis often associated with the Stoics, but found in several traditions and probably transmitted to Charleton through Descartes. As this example shows, it is often difficult to identify a particular source for such early modern concepts. Still, some terminology seems distinctively Stoic, such as *perturbatio* (Reynolds 1640: 49), 'watchfulness' (Digby 1644: 389–91), and 'circumspection or caution' (Charleton 1701: 96). Nonetheless, neo-Stoicism appears to have held sway less among early modern English theorists of the passions than with continental ones, even though such important works as Justus Lipsius' *De constantia* and Guillaume du Vair's *Morall Philosophy of the Stoicks* went through several printings in England during the century.

The reception of Epicureanism was also mixed. Astell condemned the school as advocating mere pleasure-seeking, displaying a 'sottishness' both 'vain and unsatisfactory', and 'childish and unwise' (1695: 128). Despite his associations with Epicureanism (Kraye 1998: 1297–8), Hobbes criticized those who suppose 'that the felicity of this life consisteth ... in the repose of a mind satisfied', arguing 'there is no such *Finis ultimus* (utmost aim) nor *Summum Bonum* (greatest good)' since life itself is restless pursuing and procuring (Hobbes 1994a: 11.1). But others endorsed at least some Epicurean psychological ideals. Bacon, for one, described the foolishness of fearing death in terms reminiscent of Epicurean teachings (SEH 6: 379), despite including the school in his attack on Greek contemplative ideals (SEH 5: 9, 14). And once Gassendi reconciled Epicurean physics and ethics with Christian doctrine, his neo-Epicureanism and atomism gained advocates, most notably Charleton, for whom he was the 'immortal' and 'incomparable Gassendus' (1701: 16, 19). Charleton seems to have mixed up Epicurean views with Stoic accounts of the relation between passions and false judgement (1701: 2); still, he left no doubt about his allegiances, calling Epicurus' *Ethics* '(after Holy writ) the best dispensatory I have hitherto read of Natural Medicines for all distempers incident to the mind of man ... [containing] as good Precepts for the moderating your Passions, as Human wisdom can give' (1701: 187–8).

## 19.2.4 Medicine

Until the last decades of the seventeenth century, almost every major work treating the passions of the mind also discussed the bodily states that accompanied, preceded, or followed them, using medical frameworks. That discussions of the passions took a turn towards medicine should not be surprising: as we have seen, some authors identified passions wholesale with disease, many sought remedies for unruly passions, and several identified diseases of the passions, such as melancholia. Moreover, physiology and medical theory were integral parts of natural philosophy. Indeed, Charleton was a prominent physician and founding member of the Royal Society. Holding passions to be 'in general, only certain commotions of (p. 450) the spirits and blood, ... propagated through the pathetic nerves to the heart and thence transmitted up again to the brain', he maintained that 'knowledge of the Passions [is not] to be acquir'd without frequenting the schools of anatomists' (1680: sig. C2<sup>r</sup>). Charleton's medical allegiances were complicated (see Henry 2004: 173; Booth 2005: 1–2, 5), but that did not prevent him from describing Hippocrates as 'our master' (1701: 11). Authors of very different stripes were comfortable using 'animal spirits' and Galenic 'humours' to explain the operations of the passions within human bodies (e.g. Burton 2001: 147).

Several also relied heavily on ‘sympathy’ and ‘antipathy’ as explanatory tools, concepts used by a number of traditions in medicine and natural philosophy to account for psychosomatic and other causal relations, particularly those operating without direct contact (Wright 1604: 4; Digby 1644: 295).

Another piece of common currency can be illustrated by Charleton’s claim that ‘all the various motions of the Spirits and blood, or of the Sensitive Soul, excited in the various Passions, may likewise be conveniently reduced to two general heads, namely Contractions, and Effusions’ (1701: 83). Wright, Reynolds, and particularly Digby (1644: 294) likewise appealed to contractions and dilations, which they associated with pain or pleasure in the face of evil or good, to explain the effects of the passions on bodily health. Such accounts also figured in the widespread debates about whether the seat of the passions was in the heart or in the brain. Many of the earlier authors elected the heart, while acknowledging some sort of strong and direct connection with the brain (see Wright 1604: 59–63; *Pathomachia* 1630: 50; Reynolds 1640: 74, 216; Digby 1644: 293). Notably, Hobbes did not rely so much on the schema of contraction and expansion as on the pushes and pulls typical of continental mechanism, although he located the passions in the continuation of motions from the imagination to the heart (1994b: 7.1, 8.1, 43, 46). Hobbes, however, seemed less interested in debating points of physiology than earlier authors, and many after him avoided such issues altogether: More explicitly abjured speculating about ‘those deep and natural causes of [the] passions, which lie abstruse and remote’ (1690: 53).

### 19.2.5 Plato and Aquinas

Other classical and medieval authors also shaped British early modern debates on the passions, but in less salient ways than those already considered. Plato’s influence was often filtered through other authors, even among the Cambridge Platonists. More, for instance, gave a very Platonic reading of the Cartesian ‘generosity’, taking it to shape an individual’s character so that ‘while he steadily aims at virtuous things, [he] wants no courage to enterprise what reason dictates’ (1690: 57). Norris took Platonic love as his model for the ‘abstracted’ love of God in the *Theory and Regulation of Love* (1690: 46). Broadly Platonic metaphors of (p. 451) government were applied widely both to the structure of the soul and to its states of order or disorder (e.g. Wright 1604: 68; Reynolds 1640: 46). The distinction in the *Republic* between the spirited and the appetitive parts of the soul may also have been the origin of the contrast between concupiscible and irascible passions.

However, the clearest source for the distinction was Thomas Aquinas, who took the concupiscible passions to be those directed at good or evil as such (mere desire or avoidance), while the irascible passions were directed to good or evil considered as arduous, thereby arising only in the face of an impediment. Aquinas took some such division to be necessary to the experience of emotional conflict. In this, he was followed by Wright, who separated ‘coveting’ from ‘invading’ passions (1604: 19; see also Burton 2001: 258). The contrast remained important throughout the period, particularly for those who adopted the Aristotelian list of eleven passions, but even for some who did not. More, for instance, tried to adapt the distinction to fit his Cartesian inventory of six passions, despite Descartes’ rejection of any such account as implying partitions within the soul (CSM 1: 352; AT XI: 379). More, however, reinterpreted the distinction to align simply with the formal objects of the passions: evil objects awaken irascible passions, and good ones spur concupiscence (1690: 46).

### 19.2.6 Contemporary Influences

Descartes’ importance for British philosophy of the latter half of the century is well documented (see Chapter 5, this *Handbook*). For one, a translation of his *Passions of the Soul* appeared a mere year after the French original (1650). Descartes also had direct contact with several authors considered here, including Henry More, to whom he recommended his ‘treatise on the affections’ (AT V: 347, trans. alt. CSMK: 375), which became an important source for the latter’s *Enchiridion Ethicum* (1690: 43). Indeed, many authors lifted passages wholesale from Descartes’ last work (cf. Charleton 1701: 102–3, 126, 131, 169, 175, and Norris 1687: 295, 425), albeit usually for idiosyncratic ends (Charleton 1701: 171–3, 181). At the same time, most rejected the Cartesian account of the pineal gland (see Digby, who preferred the ‘septum lucidum’ or ‘speculum’, 1644: 296–7; More 1690: 38; and Charleton 1701: sig. a1<sup>r</sup>, also 62–3).

Like Descartes (AT XI: 422; CSM 1: 372), a number of British authors drew from the late work of Juan Luis Vives, *De anima et vita* (1538), whose discussion of the affections was influential throughout the late Renaissance and early modernity (Fantazzi 2004: 571). Vives was established at Oxford for several years, and his work was widely disseminated among British authors: Burton (2001: 258) and Charleton (1701: 147) cited him as an authority, while many were influenced by his insistence that philosophy have practical utility (see Kusakawa 1996: 50, 65–6). Bacon (SEH 5: 24) and Hobbes (Hobbes 1994a: 14.31) adopted Vives' view that the proper way to (p. 452) manage and control the affects was by invoking other affects. He may also have been the source of the taxonomic principle of differentiating passions by the temporality of their formal object (most generally, good or evil), used by Reynolds (1640: 40), early Hobbes (1994b: 8.3, 48), and Charleton (1701: 87). Vives' influence was also channelled through other figures, such as Michel de Montaigne, whose *Essais* were widely read (cf. SEH 6: 504; Montaigne 1958: 187). Other French authors were translated early in the century: Nicolas Coëffeteau's *Tableau des passions humaines* (1619) appeared as *Table of Humane Passions* by Edward Grimeston (or Grimston) in 1621; Marin Cureau de la Chambre's *Les caractères des passions*, went through several editions (though with little apparent impact), as did several of Senault's works.

British philosophers also read each other. Wright seems to have been a source for many (e.g. Burton 2001: 252), transmitting both the Thomist taxonomy of passions and a defence of them against Stoic defamation. Reynolds' *Treatise of the Passions* remained a common undergraduate text at Oxford until the end of the seventeenth century (Atherton 2004: 531). Hobbes' infamy in his lifetime guaranteed that he became a prominent target. Although Charleton cited Hobbes approvingly among his pantheon of sources (yet without the glowing epithets granted Descartes and Gassendi), the typical tone for subsequent philosophers was taken by More, who held that 'those, who place the highest wisdom in self-preservation, ... do sin against the light of nature' (1690: 62; see Hutton 1996: 33). More himself exercised a constructive influence on his successors; in particular, the passionate dispositions given by our 'boniform faculty' prefigure much of what Shaftesbury and eighteenth-century authors would say about the benevolent impulses of our natural affections and sentiments.

## 19.3 General Topics and Themes

### 19.3.1 The Passions in Practice

The approach seventeenth-century British philosophers took to the passions was uniformly practical (see Gaukroger 2002: 298). Wright, Bacon, Burton, Reynolds, Digby, Charleton, More, and Norris and Astell all emphasize their practical aims. Hobbes is a tricky case, but suggestions for managing the passions fall under the policies recommended by *Leviathan* and related works (e.g. Hobbes 1994a: 31.41). More typical is Wright, who argues that knowledge of the passions furthers our interests, since 'there be few estates or conditions of men, that have not interest in this matter' (1604: 2). Above all, Wright advertises the subject for its role in (p. 453) self-knowledge; self-knowledge leads to the restraint of 'inordinate passions', and thus is key to happiness (1604: 7).

Wright is not alone: authors throughout the century take the path to virtue and happiness to lie in moderating, governing, or regulating one's passions. Bacon's *De augmentis scientiarum* presents a 'Georgics of the mind', an art of governing and cultivating human nature in a way that is supposed to 'instruct and suborn action and active lives' (SEH 5: 5). This art shows 'how a man may take aim at' the objects of moral philosophy: 'good, virtue, duty and felicity' (SEH 5: 3). On Bacon's view, the affections fall squarely within the domain of moral philosophy (SEH 4: 281; SEH 5: 19), which seeks 'to procure the affections to fight on the side of reason, and not to invade it' (SEH 4: 456). Charleton offers a remedy in a similar spirit: mental distress, he argues, is a matter of false opinions and the exorbitant desires they excite, and as such, is remediable through the 'part of human science' that teaches us 'how to moderate our Affections to the deceitful and transitory things of this life', so as to reap 'the happy fruit of internal Acquiescence and Satisfaction' (1701: sig. A3<sup>v</sup>). More too sets out to 'principally treat of the virtues, and of the passions' in order to advance 'knowledge of happiness and the acquisition of it' (1690: 3–4). Norris gives the love of God central place in a happy life and ties theory and practice together in his account of

such happiness: since ‘an affectionate sense of God will discover more of him to us, than all the dry study and speculation of scholastic heads’. In the prefatory letter to Astell, he claims that love is ‘the best practice’, and contrary to the method of other sciences, ‘tis practice here that begets theory, and those only who have their hearts thoroughly warmed and animated with the love of God can either know or describe its properties’ (1695: sig. a6<sup>r</sup>). None of these protestations, however, impressed Masham, who argued that Norris’ vision undermined our practical duties to other intelligent beings (1696: 19).

Authors besides Wright also make self-knowledge the crux of their practical aims. Reynolds’ preface specifies that the work delivers ‘knowledge of our Selves, and the Direction of our Lives’ (1640: sig. a3<sup>r</sup>). In contrast, Bacon insists we need a dose of self-deception: naked self-knowledge would leave many minds ‘poor shrunken things, full of melancholy and indisposition, and unpleasing to themselves’ (SEH 6: 378). This does not stop him, however, from striving to gain insight into various passions, virtues, and conditions of human life in subsequent essays, perhaps because he understands human goods and virtues to be heterogeneous (see Box 1996: 266). Other authors express further doubts that self-knowledge leads directly to the reformation of the passions and happiness: Burton famously ‘[wrote] of melancholy, by being busy to avoid melancholy’ (2001: 20). Digby seems to have it both ways: on the one hand, he frames his account with expressions of hope that the work will help his son cope with the vicissitudes of life; on the other, he expresses orthodox doubts about the possibility of happiness in this world. And in fact, Digby’s work is largely theoretical.

(p. 454) Hobbes does not consider the passions so much to be means to happiness as directly constitutive of happiness. Again and again, he insists that we cannot think of human happiness as a state of satisfaction or rest, since ‘life is but motion, and can never be without desire’ (Hobbes 1994a: 6.58). Instead, the *Elements of Law* maintains ‘felicity, therefore (by which we mean continual delight), consisteth not in having prospered, but in prospering’ (1994b: 7.7, 45). As a form of delight, felicity is a passion, located in Hobbes’ footrace catalogue of the passions:

To endeavour is appetite  
To be remiss is sensuality.  
To consider them behind is glory.  
...  
Continually to be out-gone is misery.  
Continually to out-go the next before is felicity.  
And to forsake the course is to die. (1994b: 9.21, 59–60)

In contrast to the competitive metaphor in this passage, Hobbes’ later *Leviathan* does not suppose that one person’s happiness must come at another’s cost. There felicity is simply a ‘continual success’, or ‘continual prospering’ (Hobbes 1994a: 6.58), that is, ‘a continual progress of the desire, from one object to another, the attaining of the former being still but the way to the latter’ (Hobbes 1994a: 11.1). This view makes felicity less a passion or appetite than the future-indexed object of a particularly complex desire: ‘to assure forever the way of his future desire’. Because non-human animals lack any conception of the future, their felicity is mere quotidian enjoyment (Hobbes 1994a: 12.4).

Particularly in the first half of the century, many authors directed their practical interests in the passions to political ends. Wright devotes more books of his *Passions of the Mind* to governing others’ passions than to self-management. He also frames his account in a kind of comparative politics: every nation in Europe, he explains, has a ruling passion or ‘extraordinary affection’ to which they are disposed, and in teaching Englishmen to bear a ‘prudent carriage’, his ‘desire is the good of [his] country’ (1604: sig. a2<sup>r</sup>). And although he first locates the doctrine of the ‘affections’ under the philosophy that considers individuals ‘segregate’, Bacon also finds a place for them in ‘civil philosophy’. Even for the individual, Bacon insists that the ‘good of communion’ is higher than ‘individual or self-good’, and thus, the active life of politics worth more than the contemplative life (SEH 5: 7–8). Knowledge of individuals should serve practical ends of communion; in particular, knowing how to govern their affections is of use both ‘in moral and civil matters’ (SEH 5: 23–4). Bacon takes the affections of individual and society to run parallel and describes the practical knowledge of how to manage the affections in terms of a social dynamic, something he thinks poets and historians convey particularly well (SEH 5: 23–4).

(p. 455) Hobbes too takes the management of the passions to be an important element of statecraft. The fundamental function performed by the sovereign within a commonwealth is to make those covenants possible that the risk of default would render ‘null and void’ in the state of nature. The sovereign accomplishes this by wielding a coercive power of enforcement, which is effective because it appeals to our fear of punishment, just as fear of death moved us to give up our natural rights and establish a commonwealth, thereby obeying the first law of nature. The sovereign also allows social life to flourish by promoting the social passions ‘that incline men to peace’, e.g. ‘the fear of death, desire of such things as are necessary to commodious living, and a hope by their industry to obtain them’ (Hobbes 1994a: 13.14). In so doing, the ‘artificial’ person of the commonwealth is itself moved by the passion for self-preservation (Hobbes 1994a: 3).

In entertaining largely practical goals, authors of the period by no means exclude theoretical discussion, for (with the possible exception of Norris and Astell) they consider practice best built on a sound foundation of theory. Digby illustrates the view nicely: on the one hand, he holds ‘the art of a statesman’ the highest among secular arts, to which all others are subordinate (1644: sig. a.iii.1); on the other, he insists the statesman must consult the metaphysician or divine. Digby’s *Two Treatises* attempts to put theory at the service of practice, sandwiching a mostly theoretical investigation within brief discussions of ‘this *science* of governing a man in order to Beatitude in the next world’ (1644: sig. a.iii.1 my emphasis). As Digby’s use shows, ‘science’ need not be purely speculative, as long as it organizes a body of knowledge from theoretical first principles to more particular consequences. Until the end of the century, many philosophic writers on the passions have pretensions to ‘science’ in this sense.

At the same time, most concentrate on concrete and practicable techniques for remedying ‘errors’ of the passions, often giving their texts the flavour of manuals or handbooks. This is particularly true of Wright, Charleton, and parts of Reynolds. Book Three of Wright’s *Passions of the Mind in General* claims to deliver ‘the means to know and mortify passions, [and] what prudence and policy may be practised in them’; to this end, it offers a series of tips for managing and moderating passions in ourselves and others (1604: 77). The remaining three books explain how to diagnose passions in others, arouse and manipulate their passions (using devices of rhetoric), and manage ‘the defects or imperfections of men’s souls’ to prevent inordinate passions. Although Reynolds does not offer such copious advice, he diagnoses the particular causes of passions, their errors, and the ‘powers’ of our faculties to allow for the self-knowledge that directs us to happiness. And Charleton stresses the importance of concrete techniques ‘which teacheth us how to moderate our affections [and] ... regulate our Actions’ (1701: sig. A3<sup>r-v</sup>).

Many authors are at their most concretely practical when they turn to concerns of health. Bacon’s essay ‘Of the Regiment of Health’ recommends specific psychic exercises, such as avoiding ‘envy; anxious fears; angers fretting inwards’, while (p. 456) entertaining ‘hopes; mirth rather than joy; [and] variety of delights, rather than surfeit of them’ (SEH 6: 453). Bacon’s main concern is to promote physical health, but he supposes it to run parallel to psychic health, with passions linking mental to bodily states. As such, friendship is a particularly effective remedy, offering ‘ease and discharge of the fullness and swellings of the heart, which passions of all kind do cause and induce’ (SEH 6: 437). Wright too discusses how ‘passions alter the body’ (1604: 59), and affect our health, in so far as ‘passions engender Humors, and Humors breed Passions’ (1604: 63, 64). Conversely, many authors defend the passions by recounting how their pleasures benefit the health of the body. Reynolds, for one, considers the effects of corporeal delight to be ‘medicinal’ for individuals—as well as for humanity at large, since it leads us to populate the world (1640: 216).

## 19.3.2 The Classifications of the Passions

### 19.3.2.1 Causal and Explanatory Frameworks for the Passions

Early in the century, Wright insisted that ‘the order of method’ required explanation through ‘the four causes of our passions, formal, material, efficient, and final’ (1604: [47]). Reynolds also adopted Aristotelian-scholastic causal approaches, appealing to the ends appointed ‘by the Wisdom and Power of Him that made [us]’ (1640: 33). With the new science and other new ‘orders of method’, philosophers fought over the nature, relation, and intelligibility of each of the four causes, and mechanists



such as Hobbes took aim at the notion of final cause in general. His *De corpore* declares '[a] *final cause* has no place but in such things as have sense and will' (*DCo* 10.7). Elsewhere, Hobbes undermines the applicability of final causes even to our volitions, introducing the passions as a way to reduce voluntary action to the forward-driving motion of efficient causation. Rather than being drawn by antecedent good and evil, our actions are pushed by the passions, for 'whatsoever is the object of any man's appetite or desire that is it which he for his part calleth *good*', and *mutatis mutandi* for 'evil' (Hobbes 1994a: 6.7). Others who dabbled in the new science, such as Digby, did not cede explanation completely to moving causes, and a revival of teleological approaches to the passions—albeit newfangled ones—emerged towards the end of the century. More, Norris, and Shaftesbury particularly attribute a teleological drive to the will and passions, but rather than reduce it to other kinds of motion, they take it to show our place in the global beneficence.

The late seventeenth-century rehabilitation of teleology particularly informs More's conception of 'the boniform faculty of the soul', which he develops as a counter to Hobbes. The faculty allows us to determine and relish the highest good (see Schneewind 1998: 203ff). As such, it has a complicated relation to our passions. (p. 457) It does not directly receive blind instincts resulting from bodily causes, which More counts as passions in the proper sense (1690: 16, 34–6). Instead, the boniform faculty both forms a part of the intellect and 'much resembles' the will in aiming at the unconditional best (1690: 6). It cannot simply be identified with virtue, by which the soul 'overrules the animal impressions or bodily passions' (1690: 11), but it does furnish the *felt* inward sense for right reason (1690: 15–16). So the boniform faculty allows us to enjoy the sense of virtue, and because More takes the feeling of pleasure to be intrinsic to happiness, it is also the seat of human happiness (1690: 7–8). Thus, More attributes a host of affective states to the faculty, albeit not passions proper. The passions are commendable in their own right: 'not only good, but singularly needful to the perfecting of human life' (1690: 41). But as sensations and blind instincts, they differ from the affective states of the boniform faculty, which follow a mind-to-world direction of fit dictated by the natural teleology of the faculty. That teleology is behind More's complaint that Hobbes reduces good to the mere 'delectation of ... animal appetite', rather than making the latter 'grateful' and 'suitable' to the boniform faculty (1690: 30).

Norris shows similar teleological tendencies, although informed by Malebranche rather than More. On the one hand, the bodily, occasional causes of our passions can be explained in purely mechanical terms, on the other: 'the natural motion of the will is to good in general' (1695: 224), a motion explained by the priority of the non-particularized love of God among our passions. As such, Norris declares God to be 'the true final cause of the will of man' (1695: 227). Shaftesbury goes even further, though on less theocentric grounds, to attribute a full-blown teleology to our 'natural affections', part of the general harmony fitting individuals to the world. So important is this natural teleology to Shaftesbury that he dismisses any other form of explanation (1999: 131).

### 19.3.2.2 The Place of the Passions in Moral Psychology

The passions occupied a protean role in seventeenth-century moral psychologies. They include species such as wonder, cowardice, and general benevolence, falling under various categories of affective episodes, habits, dispositions, and even character traits. Wright, for instance, fluctuates among diverse kinds of states in describing geographical peculiarities of temperament and our passionate susceptibilities to differences in body composition, temperature, opportunity, experience, age, and sex (1604: 37). Although this variety of usage may seem chaotic, it probably reflects the Aristotelian view that supposes dispositional states of the soul to be constituted mediately through affective responses to the environment: we gain a character by internalizing, appropriating, and habituating our affective responses, which in turn manifests itself in patterns of responses to the world. The passions can thus comprise both permanent dispositions and ephemeral episodes and straddle the gap between what is internal to the self and the world outside. As (p. 458) such, they lie beyond our immediate control, yet susceptible to indirect remediation.

Wright and Reynolds both adopt simplified faculty psychologies derived from scholastic models (e.g. Reynolds 1640: 32, 62). Wright follows Aquinas in locating the passions in the appetitive soul shared with the beasts, along with sensing (1604: 7). They are 'sensual motion[s] of our appetitive faculty, through imagination of some good or ill thing', called 'passions' and

‘perturbations’ because of their effects on our bodies (1604: 8). Reynolds comes to much the same position as Wright, while making less of the distinction between passion and action, and more of the guidance the passions offer. His account allows him a very broad sense of ‘passion’, in which passions can be formed in several divisions of the soul, including the rational and the sensitive. Thus, he admits purely ‘spiritual passions’ of love, fear, joy, horror, and (even) despair, but focuses on those passions arising in the interaction between soul and body, particularly the ‘middle passions’ that are answerable to reason, yet identified with ‘motions of prosecution or flight, ... grounded on the fancy, memory, and apprehensions of the common sense’, and so akin to the purely ‘sensitive passions’ of the beasts (1640: 37). Such passions are both responses to our perceptions of the external world, and appetitive acts directed at what we perceive. They can, nonetheless, be governed and corrected by reason. For this reason, Reynolds refuses to count our passions as corruptions, instead describing them as ‘natural motion, ordained for the perfection or conservation of the Creature’ (1640: 47).

Later authors jettison many of the scholastic elements of these psychological frameworks. Although Hobbes does not abandon faculty psychology, he reinterprets such capacities of the soul as sensing, memory, understanding, imagination, and willing in terms of the ‘animal motion’ ebbing and flowing within the human body (see Gert 1996: 159ff), which starts with sensation and is discharged in voluntary action. In the *Elements of Law*, Hobbes simply locates different faculties in different parts of the body: sense and imagination are attributed to the brain, while the continuation of those motions to the heart produces passions (1994b: 7.1, 8.1, 43, 46). The *Leviathan* is less clear-cut about the location of various faculties and instead concentrates on their functional relations. Imagination arises in the motions of ‘decaying sense’, which echo the impacts of external objects on our sense organs. These motions provide ‘endeavour’, or ‘conatus’: the small, barely perceptible beginnings of voluntary motion. Passions likewise are identified as interior beginnings of voluntary motion, writ larger and clearly directed either to or from the objects that cause endeavour (see Hobbes 1994a: 6.1–2). Passions are thus placed squarely within the imagination, the means by which it spurs us to action. They are also ‘only motion caused by the action of external objects’ within a cycle of bodily changes:

so when the action of the same object is continued from the eyes, ears, and other organs to the heart, the real effect there is nothing but motion or endeavour ... But the appearance, (p. 459) or sense of that motion, is that we either call DELIGHT or TROUBLE OF MIND (Hobbes 1994a: 6.9).

Alterations in the interior motions constituting our passions produce ‘deliberation’, and the last such passion ‘immediately adhering to the action, or to the omission thereof’ is the will, the source of voluntary action (Hobbes 1994a: 6.53).

Like Hobbes, Digby holds that passions begin with sensation and culminate in ‘moving us to, or from objects’ (1644: 295). These objects typically either please or displease us, although Digby admits we may find some ‘indifferent’ (1644: 293). A passion proper is just a change in motion, part of a ‘circuit’:

made from the object to the sense, and from it, by the common sense and fantasy, to the heart, and from the heart back again to the brain; which then setteth on work those organs or parts the animal is to make use of in that occasion, and they either bring him to, or carry him from the object, that at the first caused all this motion, and in the end becometh the period of it (1644: 306).

Depending on the valence of the object, the heart is either compressed or dilated, which in turn determines whether the passion is joy, anger, or grief. Whereas joy involves dilation and grief compression, the description of anger is more complicated, for it arises ‘when the abundance of spirits in the heart is a little checked by the contrary stroke of sense, but ... having overcome the contraction, ... dilates itself with a fury, and makes its motion smart and vehement’ (1644: 299–300). Digby thereby translates the irascible nature of anger into his preferred framework of dilation and compression. Although overly strong motions of any kind of passion ‘oppress’ the heart, moderate motions travel to the brain, and from thence to the nerves and muscles to produce voluntary action. By filtering the motions and parts of the blood, the brain determines how they move our limbs. The phenomenology of the passions arises because we feel these circulating motions, particularly those around the heart and expressed in the pericardium. Since the back-and-forth motions between brain and heart take place along the same channels and passages, whoever ‘is more attentive to outward sense, less considers or



reflects on his passions, and who is more attentive to observe and be governed by what passes in his heart is less wrought upon by external things' (1644: 303). Nonetheless, Digby holds that we are commonly 'blinded by passion' when the spirits pumped up by heart overwhelm the brain (1644: 305).

Digby is far from a materialist, but in his account of the psychology of our passions, he might as well be; understanding our passions is largely a matter of explaining their physiology. Like Descartes, he wants to show 'how all the natural operations of the body follow, by natural consequence, out of the passions of the mind, without needing to attribute discourse or reason, either to men or beasts' (1644: 301–2). Explanation requires only 'local motion and material application of one body to another' (1644: 306). Digby has an ulterior motive in calling a body a 'mere passive thing, consisting of diverse parts, which by motion may be diversely (p. 460) ordered' (1644: 342); he wants to leave room for the workings of an incorporeal, rational soul, which can exercise 'watchfulness' over unruly bodily motions (1644: 389–90).

Charleton's philosophical psychology is even more of a hybrid than Digby's, with elements of both Cartesian and Gassendian psychologies superimposed on a distinction between 'rational' and 'sensitive' souls (1701: 47). Our rational soul is immaterial, indivisible, and the seat of the 'faculties' of reasoning, judging, and willing (1701: 32). But Charleton deems it 'not a little improbable' to attribute 'all acts of the senses, and animal motions, as likewise the passions', to something immaterial (1701: 51). Thus, he introduces the sensitive soul: 'a most subtle body contained in a gross one' (1701: 13), consisting of 'fire or some matter analogous to fire' (1701: 9) and receiving sulphurous and nitrous respiration from blood and air (1701: 10–11). It acts as intermediary between the rational soul and the 'gross' material of the body, with which it has 'less of disproportion' than the rational soul (1701: 52; Charleton here seems unworried by the threat of regress). It also 'is of her own nature subject to passions' (1701: 45). Non-reasoning beasts likewise have sensitive souls, which give them a wide range of perceptual and cognitive powers, including limited consciousness and intentionality (1701: 43). But because of our rational souls, we have 'two distinct faculties of knowing' and 'a twofold appetite' (1701: 54). As 'president of all the inferior faculties', the acts of the rational soul transform those of the sensitive (1701: 32). Charleton thereby reintroduces a hierarchy within the soul. Unfortunately, our passions often revolt against this order. Such insubordination arises from the sensitive soul's affiliation with the body, for which it is the 'immediate guardian'. So that 'this province may be more grateful and agreeable to so delicate a governess, she is continually courted and presented by all the senses with variety of blandishments and tempting delights'. Thus, the sensitive soul 'often proves deaf to the voice of reason, ... [refusing] to be diverted from her sensual to nobler affections' (1701: 57–8). The remedy is to restore the natural hierarchy, on which 'depends all the happiness, or misery of not only [our] present life, but that which is to come' (1701: 54). The rational soul has affections of its own, such as the love of God and other real goods and the detestation of vice. But these are not passions strictly speaking. Following the division of the soul, our affects split into 'pure and simple affects arising and continuing without perturbation or disquiet' and 'vehement affections or perturbations of the Mind ... ascribed to the Corporeal soul, [which] seem to have their original in the seat of the Imagination' (1701: 56). Only the latter need remedy.

Another curious mix of psychologies appears in More. A passion understood broadly is any corporeal impression (1690: 33). But More is most concerned with passion taken narrowly as 'a vehement sensation of the soul which refers especially to the soul itself, and is accompanied with an unwonted motion of the spirits' (1690: 43). This account clearly borrows from Descartes (cf. CSM 1: 337; AT XI: 347–8). But unlike Descartes, More counts all life functions as soul functions, while (p. 461) distinguishing appetitive animal souls from vegetative souls. He can thus identify passions with 'blind instincts of nature, such as are perhaps found in the very plants' (1690: 36). Passions belong to the 'plastic' part of the soul, seated in the heart. But they can become insubordinate, thereby forfeiting much of their natural value (1690: 37, see also 79). More sometimes dubs unruly passions 'animal appetites' (1690: 30), probably because we animals also feel the passions in the perceptive part of the brain, and feel them so strongly that this part can be 'solicited and wrought upon, and even hurried away by the passions' (1690: 36). All these parts are located within a 'certain government or empire' of the soul, which charges the intellect with instructing the appetitive and the plastic parts of the soul (1690: 35–6), and disciplining them should they grow wayward. Above the intellect, at the very acme of the soul, perches the boniform faculty. Unlike the intellect, this faculty experiences affections and is responsible for both the sense and 'relish' for virtue, which give it an affective drive akin to the will (1690: 7). More even declares that the seed of the boniform faculty lies in divine 'love, benignity, and ... beneficence, or

well-doing' (1690: 18–19; see Schneewind 1998: 205). This sort of love is not itself a passion, but can and should be joined to passionate love (1690: 40).

Norris and Astell avoid relying on faculty psychology, even in name. Norris chides Astell for distinguishing higher and lower parts of the soul. No such differentiation is required to explain the passions: 'the same essence of the soul being variously modified may be variously affected, and be capable of different sentiments' (1695: 60–1). Astell agrees with Norris' characterization of a simple, uniformly intellectual entity, ceding that dividing the soul into inferior and superior parts makes it difficult to locate the self (1695: 84). Against their spartan view of the soul's structure, Shaftesbury introduces a novel approach that locates passions and affections within our capacities for various kinds of responses to sensed properties, including beauty and goodness. Shaftesbury thereby launches the accounts of inward senses and moral sentiments that proliferate in the eighteenth century.

### 19.3.2.3 Taxonomies of Particular Passions

Conflicts about the ordering, ranking, and affiliations of various passions form the heart of the short play *Pathomachia or, The Battle of Affections Shadowed by a Feigned Siege of the City Pathopolis*, published anonymously in 1630. Gripping drama it is not, but it does illustrate the importance accorded to issues of taxonomy. Some of the most common taxonomies derived from Aristotle's and Aquinas' canonical list of six concupiscible and five irascible passions. This list, with some modifications, is endorsed by Wright (1604: 25–6), and Reynolds (1640: 40), and forms the basis for Locke's catalogue 'Of Modes of Pleasure and Pain' in the *Essay concerning Human Understanding* (II. xx. 4–14). Yet the division into concupiscible and irascible came in for much criticism over the century, while other principles of classification proved more fundamental. As Burton notes (2001: (p. 462) 258), most classificatory schemes were shaped by forms of pleasure and pain, or love and hatred, in so far as passions are directed at good or at evil (e.g. Wright 1604: 24; Reynolds 1640: 39, 74; Stanley 1701: 202; Digby 1644: 293; More 1690: 44–6; Astell and Norris 1695: 11, 26). Pain and pleasure could count either as primitive passions, or as the overarching genera under which passions could be sorted into contrasting pairs. But Descartes also allowed a neutral passion of wonder, followed by Charleton and More (1701: 88; 1690: 44). Digby admitted neutral passions even earlier (1644: 293), while Hobbes described contempt, but not admiration, as indifferent (Hobbes 1994a: 6.5, 6.38). Descartes also provided another general taxonomy built on the six simple passions of wonder, or admiration ('the first of all the passions'); love and hatred; joy and sadness; and desire, under which he included aversion. All others are either mixtures or species of these. Versions of this list of basic passions appear in Charleton and More, who nonetheless takes issue with the scope of Descartes' classification, proposing to reduce the six simple passions to a mere three: admiration, love, and hatred (1690: 45). These would suffice for explanatory purposes, More argues, with admiration seated in the brain, and the two remaining located in the heart.

Some taxonomies were structured around the guiding role given a particular passion. Both Wright and Reynolds single out 'self-love', or *amor proprius*, which Wright names the 'nurse, mother, or rather stepdame of all inordinate affections' (1604: 11). Such self-love is a perversion of our God-given inclination for self-care, which remains moderate and proper when guided by reason (1604: 13–14). It makes the passions inordinate by allying itself with the senses to subvert the rule of reason, prudence, and the love of God. Self-love seems to spring from the intrinsic nature of love, which Wright holds to be 'the fountain, root and mother' of all other passions, yet most clearly expressed when lover and beloved coincide (1604: 216). Reynolds also takes self-love to be embedded in the nature of love, itself one of the 'two first and fundamental passions of all the rest' (1640: 74). The root of our self-love, he declares, is the 'unity and identity' we have with ourselves (1640: 84), for it lies in the nature of love to strive for union with its object (1640: 98–9). But Reynolds insists that self-love is equally grounded on the love of God, since the pleasure of self-love stems from delight in the simplicity of our being, a sign of our metaphysical perfection and likeness to God (1640: 84–5). And so, he splits the difference, declaring 'the rule of all love is by divine truth prescribed to be God, and a man's self' (1640: 81).

Despite his popular reputation as a psychological egoist, Hobbes does *not* give self-love a prominent place in his taxonomies.<sup>4</sup> It appears not once in the enumerations of the passions given in Chapter 9 of the *Elements of Law*, or Chapter

6 of (p. 463) *Leviathan*, despite the former naming almost twenty passions, and the latter over three dozen, including several species of love. More conspicuous in Hobbes' thought is the rather different 'glory', which arises directly from the dynamics of our striving for power and its relation to felicity (see Slomp 1998: 553). Glory seems a pleasing, self-directed passion: an 'internal gloriation or triumph of the mind'. But in the *Elements of Law* Hobbes makes it a special kind, a species neither of love nor joy (1994b: 9.16, 56). It is 'that passion which proceedeth from the imagination or conception of our own power, above the power of him that contendeth with us' (1994b: 9.1, 50). Although closely related psychologically to the felicitous prospect of success, glory-seeking also seems a zero-sum pursuit, destined to thwart any chances at mutual felicity (e.g. Hobbes 1994a: 13.6). But in *Leviathan*, Hobbes no longer treats glory as a fixture of human psychology (see Hobbes 1994a: 13.6, 14.31; Slomp 1998: 567), and reduces the competitive element considerably, identifying glory simply with 'confidence'. *Leviathan* also describes how the commonwealth provides outlets for the pursuit of glory that minimize its deleterious effects and even allow it to be jointly realized (e.g. Hobbes 1994a: 10.17). This change may explain why Hobbes reclassifies glory as a joy 'arising from imagination of a man's own power and ability' (Hobbes 1994a: 6.39). So, not only does Hobbes refuse ever to identify glory and self-love, he comes to reduce the centrality of glory to his account of the passions. In short, he does not orient our psychology exclusively around forms of self-interest.

The neo-Augustinian tendency in More and Norris and Astell leads them to focus on love above all other passions. But their approach differs from the earlier views of Wright, and even of Augustine and Malebranche, by making its priority more normative than taxonomic. Other passions do not reduce to love; rather, love takes precedence in an ideally ordered psyche. More gives the love that informs the boniform faculty a central normative status, and Astell dubs it the 'leading and master passion' (1695: 130). Shaftesbury characterizes our other-directed passions differently from these predecessors, but likewise finds the remedy for disordered passions in affection directed at public good, calling it 'the master-pleasure and conqueror of the rest' (1999: 202). Shaftesbury's view anticipates the importance of benevolence to such eighteenth-century sentimentalists philosophers as Hutcheson.

### 19.3.3 The Passions and Reason

One theme that appeared again and again throughout the century, even in writers of various different stripes, was the relation between reason and the passions (e.g. Hobbes 1994b: 19; Digby 1644: 305; Charleton 1975: 42). And many supposed the relation to be antagonistic. Thus, *Pathomachia* calls reason 'the conquering Alexander of the soul', without which the order of the passions dissolves (1887: 6). Left without 'remedy', this antagonism threatens the rightful pre-eminence of reason, (p. 464) leading to such disorders of practical reason as weakness of will, when like Ovid's Medea, we see the better, but follow the worse. In a common diagnosis, weakness of will arises when reason loses to passion in a direct contest for control over our bodies and will. This view makes reason and passion distinct faculties, but unlike belief-desire models of practical reason, considers both capable of determining ends.

Digby presents a vivid analysis of how reason and passion constitute two autonomous and competing 'centers' from which human actions flow (1644: 387), particularly in his account of the physiology of those 'blinded by passion' (1644: 305). Strong passions translate into vigorous motions that pump up the animal spirits from the heart (1644: 305). Reason too 'hath a great strength and power in opposition of sense' and can rule 'over sense and passion' (1644: 389–90). But it requires the use of animal spirits in the brain to work its will. When the motion of the spirits stirred up by passion is particularly violent, they may reach to the brain and there overwhelm the spirits 'in the jurisdiction and government of reason' (1644: 391). Digby (a former privateer) depicts the struggle as a sea-battle and the remedies as military strategy. Weakness of will arises when 'the throng of those [spirits] that are sent up into the brain by the desired object ... come thither so thick and so forcibly that they displace the others which fought under reason's standard ... [and so] possess the fancy with their troops' (1644: 392). To keep spirits in the brain under reason's control, Digby recommends a constant 'watchfulness', by which reason herds the spirits and marks them 'with power to recall our strayed thought' (1644: 390–1). Other tactics to repel invasion include weakening the rebellious spirits, diverting them, or increasing the forces of reason (1644: 392). Bodily remedies, such as corporeal 'mortifications', can also help subject the spirits to reason's command.

Although he lacks Digby's colourful metaphors, Locke presents a somewhat similar picture of the relation between passion and reason in *Some Thoughts Concerning Education*. He there argues against the use of corporal punishment for disciplining children since 'they distinguish early between passion and reason; and ... quickly grow into a contempt of the former' (Locke 1693: §75, 82). Children themselves are first motivated by the passions; socialization requires that they 'submit their passions, and make their minds supple and pliant to what their parents' reason advises them now, and so prepare them to obey, what their own reasons shall advise hereafter' (1693: §103, 125). Here Locke treats reason and passion as competing counsellors, but elsewhere he uses the language of rebellion to describe how upstart passions threaten legitimate reason: whereas the 'government of our passions [is] the right improvement of liberty', liberty of thought vanishes when we are possessed by 'an impetuous *uneasiness*, as of Love, Anger, or any other violent Passion'. Instead, we should strive for 'moderation and restraint of our Passions, so that our Understandings may be *free* to examine, and reason unbiassed give its judgment, being that, whereon a right direction of our conduct to true Happiness depends' (*Essay* II. xxi. 53). Continuing the political metaphor, (p. 465) Locke describes 'civil government' as 'the proper remedy' for excesses of the passions (TT II. 13). One of the chief 'inconveniences' of the state of nature is that it leaves judgement and execution of the law of nature in the hands of individuals who 'being partial to themselves' are likely to act on the basis of 'passion and revenge' (TT II. 125). And so psychic anarchy and rebellion lead to motivational disorders in civil society.

In contrast to their continental counterparts, British authors say little about the passions as a source of theoretical error. Descartes, Malebranche, and early Spinoza address the passions to further their projects for epistemic method, seeking remedies both to avoid passion-induced theoretical error and to harness the passions to the search for truth. But in segregating passion and reason into autonomous spheres of agency, few British authors seem to worry that the passions might disrupt the internal operations of reason and cause it to malfunction. Thus, they tend to treat disorders of the passions less as causes of stupidity than of madness, such as 'enthusiasm' or 'melancholy' (Burton 2001: 140; More 1656: 14). To be sure, some British authors nod at connections between the passions and cognitive error. Wright, for instance, claims that inordinate passions follow from ignorance and error in the understanding (1604: 295), but not that passions produce ignorance or error. Reynolds considers cognitive and affective reliability to be mutually reinforcing. Not only does he declare 'men of the most staid and even judgments [to] have the most unresisted power in the government of passions' (1640: 496), he also maintains that 'fastening too great an affection on some particular objects' makes us prone to the cognitive error of conceiving 'in them some excellencies, which nature never bestowed on them' (1640: 494). Reynolds likewise spares some thoughts for those passions directed at knowledge, issuing warnings against the desire for 'novelties', and cautioning us that curiosity, a passionate desire for knowledge, can lead to error (1640: 497–8). Even so, he devotes much more attention to the effects of the passions on our practical reason. Locke too indicates some role for the passions in our taking 'wrong measure[s] of probability', but leaves it at a hint (*Essay* II. xx. 17). And whereas More endorses Descartes' claim that passions induce errors in our conception of the physical world, he states his view using 'passion' to mean 'sensation' in general (1690: 84f.). Likewise Charleton adopts Descartes' theory of judgemental error, but uses the mismatch between volition and intellectual perception to explain *practical* error. We direct 'our desires aright', he states, if we refrain from willing until we clearly understand that which is 'recommended to us by our *Passions*' (1701: sig. A4<sup>r</sup>).

In this context, Hobbes presents a complicated case. On the one hand, he repeats many of the old canards opposing passion to reason: 'the *understanding* is by the flame of the passions, never enlightened, but dazzled' (Hobbes 1994a: 19.5; cf. Hobbes 1994a: 26.21; 27.4; 27.18, *inter alia*). On the other, because thought itself is a form of animal motion, and reasoning a form of thought, he cannot simply segregate reason from passion. Hobbes does, in fact, suppose a causal connection (p. 466) between the force and degree of passion and the vigour of reasoning, and maintains that 'wit' in general is driven by desires (Hobbes 1994a: 8.13–15). Nor are our passions and desires restricted to providing an initial impetus for our thinking; they hold it on course: 'for the thoughts are to the desires as scouts and spies, to range abroad and find the way to the things desired; all steadiness of the mind's motion, and all quickness of the same, proceeding from thence' (Hobbes 1994a: 8.16). Thinking in general appears a *product* of passionate drives and an expression of our basic 'endeavour'.

What seems to worry Hobbes most about the passions, and leads him to condemn them as dangerously irrational, is their tendency to sow social discord. But it is not because the passions oppose reason that they spread social conflict; rather they

count as opposing reason because they spread conflict—because the condition of war is ‘necessarily consequent ... to the natural passions of men’ (Hobbes 1994a: 17.1; see also Hobbes 1994a: 5.16). This worry, however, arises from the passions as they exist in the state of nature: idiosyncratic, partisan, and uncoordinated. There, the unaligned, passion-driven deeds of individuals work at cross-purposes to push them into zero-sum and less-than-zero-sum conflicts. The characteristic feature of such actions is that they spring from notions of good and evil determined by the individual’s passions used as ‘private measures’ (Hobbes 1994a: 46.32), which are ‘different and mutable’ (Hobbes 1994a: Review and Conclusion.1). To ‘remedy’ this feature of the passions, we need a ‘common measure’, which Hobbes identifies with reason, even as he declares that only passions can bridle passions (Hobbes 1994a: 14.31). We can reconcile these claims by understanding that passions constrain passions to produce an outcome conforming to reason. The common measure thus emerges as a result of properly aligning the passions. Reason constitutes this ‘common measure’ because it is the metric for measuring affective calibration; passions that accord with the common measure count as ‘rational’. In short, rational passions are simply *coordinated* passions. But coordinating our passions requires a sovereign power able to direct our strivings and reckonings for future felicity so that they do not jointly result in prisoners’ dilemma-like conflicts.

Turning to the social conditions for a ‘common measure’ gives Hobbes a new way to conceive of the relation between reason and the passions. Reason discovers the laws of nature (Hobbes 1994a: 14.3), including the fundamental injunction of justice: that persons are duty-bound to ‘perform their covenants made’ (Hobbes 1994a: 15.1). Yet Hobbes deems ‘the bonds of words ... too weak to bridle men’s ambition, avarice, anger, and other passions, without the fear of some coercive power’ (Hobbes 1994a: 14.18). Such coercive power resides in the sovereign, who uses it to put pressure on our passions; by deploying threats, it generates fear and respect to force our passions into line with the passions and actions of others. This is a necessary condition for the possibility of covenants not immediately beneficial to both parties, and hence of justice itself (Hobbes 1994a: 15.4). The sovereign, in (p. 467) turn, is itself subject to natural laws enjoining justice, equity, perspicuity, mercy, prudence, publicity, and the like (see Hobbes 1994a: 15, 30). Although natural laws are simply precepts of reason and binding on anyone who finds herself in the appropriate conditions for their application, the motive for obedience lies in our passions, particularly fear of the consequences for disobedience. In playing upon fear to motivate actions that are coordinated with the actions of others, the sovereign instantiates the common measure for our passions, while determining what constitutes right reason. Only so can reason come to govern our actions.

Hobbes allows that natural individuals are individually capable of various means-end calculations. But in the absence of a common measure, such reckoning is not ‘right reason’ (see Gert 2001: 253). Right reason arises when persons settle controversies by setting up ‘the reason of some arbitrator or judge to whose sentence they will both stand’ (Hobbes 1994a: 5.3). Indeed even individual reckoning may require the stability provided by a common measure (Hobbes 1994a: 5.3; see also Ridge 1998: 544–6; Gauthier 1992: 24–32; Baier 1987: 163–6). When Hobbes turns to how the sovereign power functions as a public reason, he stresses that it determines goods and evils of all kinds. In contrast, individuals in the condition of mere nature retain the ‘right of nature’: the liberty of each to use ‘his own judgment and reason’ to decide ‘the aptest means’ of self-preservation (Hobbes 1994a: 14.1). Such decisions are driven by momentary passions without any guarantee of consistency even with other passions of the same individual across time. When individuals establish a commonwealth, they transfer the right of nature to the sovereign, and thereby make themselves subject to *its* determination of apt means. It provides a standard outside of private individuals, one that can impose normative demands on both their passions and their reckonings. And so, individuals become fully rational only by submitting to the determinations of a public reason instantiated in the sovereign power. The remedy for the passions must come from the top down, even though the motivations for applying it flow from the bottom up.

Although Hobbes’ view of the relation between reason and passion may be unusually sophisticated, neither he, nor any of the other seventeenth-century authors under consideration here adopt anything like the belief-desire model found in many contemporary accounts of practical reason. Not only do they entertain conceptions of reason more robust than instrumental ones, they also envision the passions as much more than mere end-directed desires. They are traces of how the world marks itself in the material of our bodies and expressions of our responses to its impressions. For some, they are also what drive us to unite with God, or the cosmos as a whole. They are critical to our happiness, but in constant need of ‘remedy’. We must



appeal to them to manage others, yet they are unruly and idiosyncratic. They are utterly personal and central to individual character, both shaping it and manifesting it. At the same time, they are only poorly integrated with the rest of the self, and can seem alien intrusions, or fractures in (p. 468) the unity of the psyche. Weaving together these different threads into a unified account of the passions challenged seventeenth-century conceptions of the soul and its faculties, and raised a host of questions about its relation to reason, the body in which it lodged, the material world with which it interacted, and the society in which it moved. But starting early in the next century, philosophers began forming a very different picture of the mind and its passions, which raised new questions about the nature, activity, and value of our sentiments. Some of that difference might be measured by the fact that in less than two generations, the most prominent philosophers would move from asking about ‘remedies’ of the passions to declaring that ‘reason is, and ought only to be the slave of the passions’ (Hume 2007, 1: 266).<sup>5</sup>

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## Notes:

- (1) Surveys include Levi 1964, Gardiner 1970, Rorty 1982, James 1997, 1998a, and 1998b, and Schmitter 2010; a few recent anthologies are Gaukroger 1998, Kahn, Saccamano and Coli 2006, and Paster, Rowe, and Floyd-Wilson 2004.
- (2) See ‘Early English Books On-Line’ (2010), which records at least one instance of ‘passion’ in over 8 per cent of its database of seventeenth-century Anglophone works.
- (3) In the case of texts where there is no modern edition, I have preferred the earliest complete edition, but modernized spelling, capitalization, and punctuation.
- (4) On this topic, cf. Curley in Hobbes 1994a: xv; Gert 1996: 165–8, 2001: 243; and Lloyd and Sreedhar 2009. Note that Hobbes’ few comments about self-love make it a source of unreason (Hobbes 1994a: 15.35; 1994b: 10.11, 63–4).
- (5) For help and patience, thanks go to Peter Anstey, Alan Gabbey, Dan Garber, Greg Weber, and especially John Kardosh. Research on this chapter was supported by the Social Sciences and Humanities Research Council of Canada.

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## Natural Law and Natural Rights

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### Abstract and Keywords

This chapter, which analyzes the conception of natural laws and natural rights in Great Britain during the seventeenth century, suggests that the widely held belief that rights depend for their existence on being granted by law is not true, and that the opposite is arguably closer to the truth. It also explores the writings on politics and religion during this period that mentioned natural laws and rights.

Keywords: natural laws, natural rights, Great Britain, seventeenth century, writings on politics, religion

NATURAL law and natural rights were among the key concepts in seventeenth-century moral and political thought, and figured prominently in the intense political conflicts of the time. When early modern authors spoke of natural law and natural rights they agreed that ‘natural’ signified that these laws and rights could be known by human reason independently of revelation.

The Law of Nature was most commonly thought of as a set of precepts issued by a legislator, by analogy with civil law, imposing obligations on those subject to it, and with sanctions against non-compliance. Locke summed it up nicely: duty ‘cannot be understood without a Law; nor a Law be known, or supposed without a Law-maker, or without Reward and Punishment’ (*Essay* I. iii. 12). Consequently, natural law theory needed natural theology.

The Law of Nature also requires authority. Authority is a right or power required for an obligation to obtain. The noun ‘right’ was also used for other concepts, among them liberty, that is, of not being under an obligation. But in addition to these basic notions of authority, obligation, and liberty, another distinctive conception played a significant role in many theories. It was that of a special range of things pertaining to the self and being truly a person’s own (*suum*). Essential to this conception is that a violation of anything that is one’s own, be it a right or something else, makes the use of force against the offender permissible. This conception of what pertains to the person has suffered neglect in the literature dealing with theories of rights.

(p. 473) The number of writings on politics and religion in which these concepts appear was great, especially during the civil wars and the Interregnum (1640–1660), so the following survey has to be selective. Happily, however, the many theories can be grouped into two kinds. In natural law theories it is the will of God that creates obligations; in the theories here falling under the heading ‘natural rights’, it is the will of man.

## 20.1 Natural Law in General

According to Aquinas, who was a major influence on early seventeenth-century natural law theory, natural law is founded on and is an incarnation of eternal law, and so has its ultimate ground in the immutable essence of God himself. It can be known by the use of our natural faculties independently of revelation. An important consequence of this view of the eternal law as a ground is that the divine will behind natural law is not arbitrary.

Another source for the idea of an immutable natural law was Stoicism.<sup>1</sup> Cicero had produced an eloquent statement of Stoic universalism and cosmopolitanism: 'True law (*vera lex*)', he wrote, 'is right reason in agreement with nature. It is valid for all nations and all times. Human legislation cannot repeal it. We know it by looking inside ourselves. God is the author. If we disobey him, we deny our own human nature, and the penalties will be dire'.<sup>2</sup>

The laws mentioned in this famous statement are *precepts*. In Stoicism, laws governed physical processes, animal life, and human conduct alike, within a harmonious world order. This pagan philosophy was easy to reconcile with much of Christian dogma.

Richard Hooker's (1554–1600) concept of natural law had much in common with this. His influential *Of the Laws of Ecclesiastical Polity* defended the newly established Church of England, with its hierarchical structure and the monarch as its head, against Puritan attacks (LEP 1. 1. 3: 53–4).<sup>3</sup> Its plan was to consider law in general, and then more specifically the eternal law and the law of nature and of Scripture (LEP 2. 1–2. 4: 54–7). As in Aquinas, the law of nature is an expression of the eternal law. It is the divine decree whereby everything is directed for its proper purpose. God is a law both to himself and to all else. This is a conception shared, he says, by (p. 474) the Stoics. He wants to make very clear that 'They err ... who think that of the will of God to do this or that, there is no reason besides his will' (LEP 1. 2. 5: 56–7).

God's will is not arbitrary, even if the reason behind His decree may be unknown to us. The Law whereby He works is eternal and therefore immutable (LEP 1. 2. 5–6: 57–8). Hooker defines the eternal law as 'that Order, which God before all ages has set down with himself to do all things by' (LEP 1. 2. 6: 58). He is aware that his outlook changes the sense of 'law'. It does so in two ways. Law is commonly taken to be issued by a superior authority, but this is not so with the law that God Himself observes. Secondly, the meaning of 'law' is extended to cover 'any rule or canon whereby actions are framed'. In one passage, he enumerates eight different kinds, including those we now think of as the laws of science (LEP 1. 16. 1: 120–1). His concept of law certainly covers more than the precepts which men ought to observe.

The same applies to the concept of law according to the Roman jurist Ulpian in a passage inspired by Stoicism and constantly cited:

Natural Law is that which nature has taught all animals, for this law is not peculiar to the human race, but applies to all creatures of the air, the earth, or the sea. From it are derived the union of male and female which we call marriage; and the procreation and the upbringing of children; for we see that also other animals are considered to have knowledge of this law. (*Corpus iuris civilis: Institutiones* (henceforth '*Inst.*') 1.2.pr.; *Corpus iuris civilis: Digesta* (henceforth '*Dig.*') 1.1.1.3 similarly)

Among those who rejected this wide concept of law was Nathaniel Culverwell (1619–1651), the only Cambridge Platonist to invoke natural law theory as the foundation of his rational ethics (Hutton 2008). He insisted that 'a Law in its strict and peculiar notion, does only reach to rational beings' (Culverwell 2001 [1652]: 39; cf. 25, 40, 43, 44). Men of learning agree, except, Culverwell added sarcastically, the lawyers, who are happy to go along with the opinion just quoted, because their greed seduces them into wishful thinking. They would like to bring beasts, birds, and fishes into their courts in order to have some fees out of them (Culverwell 2001: 41).

Lawyers were widely held in great disesteem (Prest 1981; 1986: 285, 287). In 1659, William Sprigge (quoted in Zagorin 1966: 156) called them 'professors of iniquity'. Some of the reasons were the same then as now, but there was also a political dimension, about which more below.

Culverwell was not the first to reject the wide notion of natural law. He cited two foreign authors whose writings were



influential in Britain. Suárez, opposing Aquinas on this point, insisted that laws properly so-called are precepts which create obligations, and cannot apply to non-rational beings. The laws of natural science are only metaphorically so called (Suárez 1971 [1613]: 2.2.12; 2.3.7). Grotius was of (p. 475) the same opinion<sup>4</sup> and this view was gaining ground. Some decades later, we find it in Cumberland (TLN 5 §2: 502).

The view that the laws discovered by natural philosophy (or natural science, as it began to be called, e.g. by Cumberland) are precepts was decisively rejected by Robert Boyle in a work written in the 1660s, though published much later. He wrote:

But to speak strictly, (as becomes Philosophers in so weighty a matter), to say that the *Nature* of this or that Body, is but the law of God prescrib'd to it, is but an improper and figurative Expression ... to speak properly, a Law being but a *Notional Rule of Acting according to the declar'd Will of a Superior*, 'tis plain, that nothing but an Intellectual Being can be properly capable of receiving and acting by a Law. For if it does not understand, it cannot know what the Will of the *Legislator* is; nor can it have any Intention to accomplish it. (B 10: 457)

## 20.2 Natural Law for Mankind

It would serve no purpose, Hooker thought, to discuss the law of reason that ought to guide human conduct unless two preconditions were satisfied. People will not care for laws, unless the basic necessities, food and clothing, are supplied: 'A righteous life presupposes life' (LEP 1.10.2: 88).

Relativism would also make moral theorizing pointless. Hooker mentioned the kind represented by ancient sceptics and sophists, such as Protagoras. He disposed of it swiftly, noting St. Augustine's dismissal of it in *De doctrina Christiana* (3.52 (III.xiv.22)) by pointing to moral universals, such as the golden rule. Hooker acknowledged that societies varied in their customs and moral opinions, but argued that cultural diversity does not imply ethical relativity. What has happened is only that lewd and wicked custom arose in some places, spreading from a few and continuing over time (LEP 1.8.10–11: 82–3).

Few writers on natural law at the time took an interest in relativism. Most did not even mention it. And with the exception of Culverwell, who devoted a chapter to a refutation of the ancient sceptics, and the leading Cambridge Platonist Ralph Cudworth (1617–1688), it must have seemed irrelevant to the writers deeply involved in the political and theological conflicts of the time. Cudworth 'abundantly refuted' Protagoras' relativism (EIM: 4.6.1), and the relativism he attributed to Epicurus and Hobbes, who from the mid-century had become the usual suspects in (p. 476) the polemic against philosophical heterodoxy. In contrast, Montaigne and other neo-sceptics are almost unheard of in these contexts (Mautner 2005).

Evaluations of character rather than conduct received scant attention from those who wrote on natural law. Their main interest was in questions of right and wrong, rights and obligations, justice and injustice, as could be expected in a century of acute political conflict. The moral evaluation of personal character, to which Shaftesbury paid attention by the end of the century, was likely to attract controversy of a different kind. Such theories attributed merit to virtuous persons, which was difficult to reconcile with theological doctrines of man's depravity, total selfishness, and desperate need for salvation. As for the action-guiding precepts of natural law, a variety of opinions emerged concerning our knowledge of them, their binding force, and their content.

### 20.2.1 The Knowledge of the Precepts

In every natural law theory properly so called, the precepts are taken to be known independently of revelation. The appeal to nature is an appeal to reason. The more puritanically minded, who mistrusted man's natural faculties, responded with suspicion or at least caution. Scripture should be the canon, rather than fallible reason. No law should guide human agents unless it was revealed in Scripture (LEP 1.16.5: 124). Hooker argued against this, pointing to moral truths beyond those revealed in Scripture. Moreover, Scripture does not explain how it is to be interpreted, and in many places it is far from obvious whether an action is commended, condemned, or merely reported. This was one point also insisted on by Robert

Sanderson (1661, ch. 3 §§4–12: 78–88).

The common view was that the precepts of natural law were written in the hearts of all human beings (Romans 2: 14–15). Suárez used the popular metaphor of the light of nature:

We know by the light of nature that transgressions of the law of nature offend God and that it is for him to judge and punish them. Therefore this natural light is by itself a sufficient promulgation of the law of nature. (Suárez 1971 [1613]: 2.6.24)

William Ames (1576–1633), more strictly Calvinist than most of the writers mentioned in the present chapter, warned that this law of nature, which God has written into the hearts of all men *naturaliter* (i.e. not by special revelation), could be occluded, due to man's sinfulness, though it could never become wholly invisible even to the most depraved (1639: 1. 2 §§4–5: 103–4). Culverwell, who frequently referred to both Suárez and Grotius, demurred (Greene, Foreword to Culverwell 2001: xv). In his florid, indeed luxuriant, prose, he rose in defence of reason, styled by him 'The Candle of the Lord' (Proverbs 20: 27). God had set up 'an Intellectual Lamp in the soul' (Culverwell 2001: 65). The detractors of reason, (p. 477) he thought, had become prejudiced against it because of the Socinians' over-reliance on it.<sup>5</sup>

Introspection was not the only way to know one's duty. Hooker proposed that often 'the most certain sign of evident goodness is if the general persuasion of all men do so account it'. He conceded that 'some errors are commonly accepted', but there is a remedy: 'they can be detected by looking into what gave rise to them' (LEP 1.8.3: 78). Selden, Culverwell, Robert Sharrock, and Samuel Parker agreed with Grotius, who referred with approval to Cicero's opinion that such *consensus gentium* provides very strong, albeit not infallible, evidence (JBP 1.1.12.1; von Leyden, Intro. to Locke 1954: 41).

Cumberland did not disagree, but made a radical break by invoking another kind of empirical evidence, that offered by the natural sciences. They could supply a firm empirical basis for our knowledge of the law of nature. His concept of this law was wide, including all the norms and values that have a bearing on character and conduct.

the Whole of *moral Philosophy*, and of the Laws of Nature, is ultimately resolv'd into *natural Observations* known by the Experience of all Men, or into Conclusions of true *Natural Philosophy*. (TLN 1 §3: 291)

What is radically new is the thesis that our moral knowledge is nothing over and above empirical knowledge of physical (in a broad sense) and psychological facts (see Ewald 2000; a contemporary version of the thesis is in Wilson and Ruse 1986). Our duty to act in certain ways is known empirically through the sanctions, i.e. rewards and penalties, caused by the act. They consist in the happiness or misery for the agent caused by the act (TLN 1 §12: 308). In this mode of thinking, hangovers serve as evidence that excessive drinking is wrong. In such a case, one can rely on common knowledge. In other cases, scientific knowledge is needed. Either way, good and evil (Cumberland frequently shifts between the good, the right, and the obligatory) are as empirically ascertainable as the medical or poisonous qualities of a herb (TLN 1 §28: 341). As for secret wrongdoing, he noted that '[w]icked Persons have often betray'd themselves in their *Dreams*, in their *Ravings*, in their *Cups*, or in a sudden Fit of *Passion*' (TLN 1 §26: 334). These empirical points will not, of course, convince a 'sensible knave' who observes the general rule that honesty is the best policy, but also takes advantage of the exceptions and is shrewd enough to avoid detection.

Samuel Parker's (1640–1688) *Demonstration* (1681) combined influences from the recent work of Cumberland with more traditional ones, and argued that natural law was obligatory and represented the will of God. His treatise is on the whole (p. 478) unoriginal, but has the merit of being in an English more readable than Cumberland's rambling and inelegant Latin prose. He wrote:

the first and fundamental Principles of good and evil ... are ... legible in the whole Contrivance and all the Appearances of Nature. (1681: 1. 1 §2: 8)

Our moral duty and the moral order emerge from the physical order which we find around us. Like Cumberland, he

maintained that we know empirically that the goal of nature and of human beings is the common happiness of mankind both in this life and the next.

The appeal to common or scientific empirical knowledge is a remarkable precursor to ethical naturalism which became prominent from the mid-nineteenth century onward, and which was the main target for G.E. Moore's attack in *Principia Ethica* on the so-called naturalistic fallacy. It has been uncongenial to much of twentieth-century metaethics, but in various forms, including evolutionary ethics, it remains on the philosophical agenda.

A different account of how the precepts could be known was suggested by John Locke. They would be like theorems proved from axioms:

The *Idea* of a supreme Being, infinite in Power, Goodness, and Wisdom, whose Workmanship we are, and on whom we depend; and the *Idea* of our selves, as understanding, rational Beings, ... would ... afford such Foundations of our Duty and Rules of Action, as might place *Morality amongst the Sciences capable of Demonstration*. (*Essay* IV. iii. 18)

Some propositions that Locke found self-evident will be mentioned below.

Locke's view was the common one: some precepts are known independently of revelation (although, as has been shown, views on how they are known varied), some precepts are known only by revelation, and some are known in both ways (TT I. §63; TT II §31; TT II §52).

However, Locke soon began to have doubts. Only a few years later, he wondered whether perhaps it is 'too hard a task for unassisted Reason, to establish Morality in all its parts upon its true foundations with a clear and convincing light'. Human reason had 'never from unquestionable Principles, by clear deductions, made out an entire Body of the *Law of Nature*' (Locke 1999 [1695]: 14 §2: 148, 150). He also doubted whether the project was worthwhile. Even if it succeeded, only a minority among the educated would understand the axioms and proofs. It would be a troublesome and in any case unnecessary enterprise, because after the coming of Jesus Christ, such a theory is not really needed, since revelation through the gospel now contains the entire body of morality in a form that can be understood by everyone.

Curiously, Locke did not change the passage quoted above from *Essay* IV. iii. 18 in the later editions of his *Essay*, despite his doubts about demonstrative moral knowledge. But he continued to believe that natural non-demonstrative knowledge was possible:

(p. 479) [Locke] never relinquished his confidence that natural law could be known; to do so would not only have denied the foundations of government set forth in *Two Treatises*, but would also have eliminated the basis of human sinfulness upon which revelation was justified. (Higgins-Biddle, Intro. to Locke 1999: cvii)<sup>6</sup>

It was taken for granted by most writers, including Locke, that there could be no genuine contrariety between reason and revelation (Walker 1963: 78). Sampson mentions the apparent disharmony between on the one hand a right to defend oneself and to kill an aggressor, admitted by reason, and on the other hand the duty enjoined by the Law of God to love one's enemies and return evil with good. 'Here, neither norm was rejected, but discussions about how to adjudicate between them are difficult to find' (1988: 94–5). In Britain the time had not yet come for thinkers who would be prepared to assess moral dilemmas as radically as Pierre Bayle did. He maintained that by the light of reason, Christianity is profoundly immoral. It praises a God who condemns wise and good pagans and unbaptized infants alike to eternal torment. Human reason cannot doubt that such a God is unjust, but for revealed religion doubts about God's justice are unjustified and may indeed be held to be mistaken (Walker 1963: 79).

With few exceptions, our writers did not probe deeply into the question of how moral truths are known. This was to come in the next century, with ethical rationalism and moral sense theories.

## 20.2.2 The Obligation of the Precepts

The precepts of natural law were taken to be laws imposing obligations. This distinguished them from action-guiding statements of the kind used to give advice or make a request. Laws make compliance obligatory, not merely recommended. These obligation-imposing precepts were taken to spring from an authoritative will, with threats of sanctions in case of non-compliance and promulgated to those subject to the authority. The precepts of natural law could, of course, only have the will of God as their source (Parkin 2007: 211). John Selden (1584–1654) stated the common view: ‘any law is will, and natural law is the will of God. I can only be bound by a Superior’ (Selden 1927: 116).

Since natural law can be known by reason independently of revelation, the introduction of God must be by natural theology. Even so, a need remains for a rational explanation of what it is about God that makes His will authoritative.<sup>7</sup> It is a question that ‘opens a spacious Field of Inquiry’ (TLN 7 §5: 668).

(p. 480) Most authors agreed, against Thomas Hobbes (*Lev.* 31. §5: 246), that God’s immense power was not the answer. Cudworth was particularly anxious to avoid depicting God as a despot. God is indeed a lawmaker with authority. Authority is a right: it ‘consists in a right to rule’. There are, however, limits on how this right can be exercised. As Cudworth summed up his outlook: ‘*God’s own Authority [is] bounded by Justice*’ and all *other* authority is also ‘*Essentially Founded in Natural Justice*’. He continues:

*there being no Authority to Command, where there is not an Obligation to Obey; and Commands not Creating Obligation but Presupposing it, without which they would signify Nothing. The First Originall Obligation not from Will, but Nature.* (TIS: sig. I2<sup>v</sup>, col. 1)

Cudworth mentions ‘the right or authority of the commander, which is founded in natural justice and equity, and an antecedent obligation to obedience in the subjects. [This is] presupposed before all laws to make them valid’ (EIM: 1. 2. §3: 18).

Much more common was the view that we are under an obligation to God out of gratitude for the benefits He benevolently bestows on us. This proposal does, however, face two major problems: one logical, one ethical. If all obligations (among them the obligation to be grateful to God) come into being by divine command, and if we are under an obligation to do what God commands because we are under an obligation to be grateful to God, paradox ensues. And ethically, it is inexplicable why non-compliance, as an expression of ingratitude or failure to requite divine love, should deserve punishment. It is true that Scripture knows of a resentful God who deals severely with those who by their disobedience show that they despise His blessings and fail to return His love, but this is a matter of faith, well beyond reason, and therefore beyond the ken of natural law theory.

George Lawson (1598–1678) mentions gratitude, but in the main he seems to ground God’s unlimited right of command over us in His being our creator and therefore having an absolute property in us. We are not, however, subject simply to His power, but to His power combined with His will and understanding (Lawson 1657: 150–3; similarly Lawson 1992 [1689]: 1 §1: 15). Edward Stillingfleet (1635–1699) shared this outlook. God, being the sole creator and governor of the world, has alone the absolute and independent dominion and authority over the souls of men (Stillingfleet 1662 1 §2: 11). Cumberland mentioned ‘*the common Doctrine, which derives God’s Right of Dominion, [over those subject to it] from his having created them*’ (TLN Synopsis ch. 7: 244). Locke likewise assumed that a maker’s authority over his product is a principle for which reason has support in revelation (TT II. §6). In the *Essay* the right of creation is also mentioned:

He has a Right to do it [to set rules for man], we are his Creatures; He has Goodness and Wisdom ... ; and he has Power to enforce it by Rewards and Punishments, of infinite weight and duration, in another Life: for no body can take us out of his hands. (*Essay* II. xxviii. 8)

(p. 481) This was the view most widely adopted. It was no doubt presumed to have a basis in natural theology, but scriptural authority was regularly invoked (e.g. Romans 9: 20–1).

Still, does a creator always have a right to do as he pleases with what he creates? Cumberland admits that he used to accept this common view and to deduce God's dominion from His being the creator (TLN 7 §7: 672). He had, however, become aware that this view was uncomfortably close to Hobbes'. The limitless power of a creator/producer over his product is indeed closer to might than to right. He proposed an alternative. It still assumes that every dominion supposes some right, and that every right supposes some law. Since God is subject to no law, Cumberland's new view is that the right of the Deity over his creatures 'is granted to Him by His own Wisdom and goodness as by a law' (TLN 7 §7: 673). However, the original Latin expression 'as by a law', 'as' (*velut*) means 'as if': the reader is offered a fiction rather than an explanation.

Hobbes, as mentioned, maintained that God's right is derived from His irresistible power. In the absence of a common power capable of overawing everyone, that is, whenever two parties have no common superior, each has by nature a right to do what he has a power to do, and the more power he has, the more he can, by right, rule over others. God and man have no common superior; God alone has irresistible power; therefore He can rule over everyone with full right (*Lev.* 31. 5 246). This view provoked strong opposition. It seemed blatantly to identify right and might, and to exhibit blind adoration of brute force (see Parkin 2007; Bowle 1951; Mintz 1962).

It seems that Hobbes erred when he used God's omnipotence to explain our obligation. Because the right that Hobbes attributes to God is a liberty to do or to forbear which, in this theory, does not have obligations as a correlate. They come into being only through promises and covenants.

The common view, illustrated by the opinions cited above, was that for a precept to impose an obligation, it was necessary for the precept to have an authoritative source, understood to be the will of a superior made known to those subject. It was also thought a necessary condition that sanctions would be attached to non-compliance. Locke represented common opinion: the sanctions are chiefly the rewards and punishments in a future state (*Essay* II. xxviii. 8; 1999 [1695] 14 §4: 162).

This outlook creates a problem for ethical theory. A sense of duty would, in part, be an awareness of sanctions in case of non-fulfilment; and yet a sense of duty or 'love of virtue' is a quality of a morally good person for whom sanctions are irrelevant. It follows that obligation cannot be identified with liability to sanctions. The nature of obligation remains unexplained.

### 20.2.3 The Content of the Precepts

What gives the rules their binding force remained problematic. In contrast, the content of the rules was not. There was broad agreement about the general norms (p. 482) of conduct claimed to be discernible by human reason. Among the vast number of rules not in dispute were all those enjoining respect for the commands issued by persons in authority (rulers, masters, fathers, husbands) by those subject to them. Rules of that kind could admit of exceptions, but at the most general level, reason could recognize principles of universal application. At the more particular level, casuistry would set in.

Hooker mentions various basic precepts discernible by reason: the greater good is to be chosen before the less; God is to be worshipped; we should love our neighbour; parents are to be honoured (LEP 1. 8. §5: 78).

The classical *praecepta iuris* (precepts of justice) were often quoted as a summary of the law of nature: *honeste vivere, neminem laedere, suum cuique tribuere*.<sup>8</sup> *Honestum* includes everything that is morally right. The other two enjoin, in effect, respect for persons and their rights. Ames objected that they were vacuous. For instance, he complained that the harm principle is not valid without qualification: in some cases, it is not wrong to harm a person—an unjust aggressor, say—and the formula is acceptable only on the trivial interpretation that unlawful harm is unlawful. Ames' objections are reasonable, although rather clumsily formulated, especially in the translation, but they can be met by designating independently the items that constitute one's own. Grotius and Locke did just that, as will be shown below. Another general principle, enunciated by many authors was: 'Do to others what you would have done [by others] to you'. Ames pointed out that it ought to be qualified, or else it could be taken as an exhortation to incite others to drunkenness and lewdness, if you would have them incite you likewise. He preferred the negative formulation (Ames 1630, 1639: 5. 1. §§19, 20). Stillingfleet's

*Irenicum* (1662: 1. 1. §2: 9), however, mentions with less circumspection ‘Do as you would be done to’ as an example of a universal principle.

The usual method for establishing the content of the precepts was, in fact, to rely on moral intuitions influenced by the authors’ religious and moral upbringing. Cumberland, inspired by the example of Hobbes, whom he set out to refute, was more ambitious. He aimed to reduce all the precepts of a universally valid law of nature to one principle, namely this: we should endeavour to promote the common good of the whole ‘system of rationality’, i.e. all rational beings, according to our ability (TLN Intr. §15: 262). This includes the love of God and mankind, and the greatest happiness for all. He could subsume under this principle all our ordinary moral beliefs: ‘*keeping Faith, Gratitude, natural Affection, &c.* are either *Parts or Modes* of a most effectual *Benevolence* towards all’ (TLN 1 §8: 299). Under the principle of universal benevolence would also be subsumed, inter alia, liberality, prudence, frugality, gravity, courteousness, taciturnity, veracity, urbanity, moderate (p. 483) self-love, familial duties, modesty, humility, and magnanimity. These are all virtues because they promote the common good (TLN ch. 8).<sup>9</sup>

For Cumberland, the good is happiness, and right action consists in promoting the good of all. This is why he came to be regarded as a utilitarian, or indeed as the founder of that tradition (Sidgwick 1954 [1886]: 174; Albee 1901). Doubts have been raised whether his theory should be so described (Haakonssen 2000: 29), and Irwin (2008, 2: 228f.) notes that Cumberland’s theory does not include calculations that offset harm to some against benefits for others, in contrast to mainstream utilitarianism.

According to Locke, the divine law is ‘promulgated to them by the light of Nature, or the voice of Revelation’ (*Essay* II. xxviii. 8). The former is, of course, natural law. In his published works, chiefly the *Essay* and *Two Treatises of Government*, his account of its precepts is limited: neither work was designed to present a full natural law theory. In *Essay* IV. iii. 18, where Locke suggested that morality is capable of demonstration,<sup>10</sup> he gave two examples of self-evident propositions: ‘Where there is no Property, there is no Injustice’ and ‘No Government allows absolute Liberty’. The *Two Treatises* has more to offer. The law of nature would require respect for individuals’ property, where ‘property’ is taken to include what belongs to an individual (i.e. the *suum*): life, liberty, health, limb, goods. It also permits the use of force in order to restrain or punish aggressors. Still, ‘it is indeed a strange fact ... that natural law, a basic idea in Locke’s whole system, is not discussed at length in any of his published works’ (von Leyden, Intro. to Locke 1954: 13).

Hobbes proudly declared that his was ‘the true Morall Philosophie’ (*Lev.* 15. 40: 111), that is, ‘the Science of what is *Good* and *Evill*, in the conversation, and Society of man-kind’ (*Lev.* 15. 40: 110); it was superior to *all* previous moral philosophy in that it not only admitted the traditional virtues, but for the first time correctly explains ‘wherein consist[s] their Goodnesse’. The moral philosophy to be superseded was that offered in courses on Aristotelian and sometimes also other ancient Greek ethics.<sup>11</sup> But Hobbes’ theory also, of course, supersedes the attempts to infer moral precepts from supposed purposeful designs to be found in the natural world.

The background was in his well-known account of man’s natural inclinations which will inevitably lead to violent conflict. He summed up the ‘three principal causes of quarrel’ under the headings competition, diffidence [i.e. distrust], and glory (*Lev.* 13. 6: 88).

(p. 484) Many critics felt that Hobbes was slandering human nature. Shaftesbury gave the complaint an intriguing twist: Hobbes’ theory had ‘done but very ill service in the moral world’ in that his low opinion of human nature had given strong encouragement to a kind of religion that had emerged, ‘opposite to Good-nature; and founded in Moroseness, Selfishness, and Ill-will to Mankind’ (Shaftesbury 1698: sig. A6<sup>r</sup>) His readers would know whom or what he had in mind, but he assured them it was not the Church of England.

In any case, without security and protection, the condition of man becomes ‘solitary, poore, nasty [i.e. foul, offensive to the senses], brutish, and short’ (*Lev.* 13. §9: 89). The formulation is memorable—and remembered—but equally important is his reminder of the blessings of civilization and culture which require security. Without it, there is



no place for industry, because the fruit thereof is uncertain, and consequently no culture of the earth, no navigation, no [imported goods], no commodious building, no [technology], no knowledge of the face of the earth, no account of time, no arts, no letters, no society. (*Lev.* 13. §9: 89, freely modernized)

Hobbes enumerates a considerable number of ‘laws’ of nature, chiefly in *Leviathan* chapters 14 and 15. The reason for all of them is that without them, there can be no ‘peaceable, sociable, and comfortable living’ (*Lev.* 15. §40: 111). The two principal precepts enumerated are those of eirenicism: we should seek peace whenever it can be had (and otherwise defend ourselves as best we can), and of reciprocity: we should not do to others what we would not want them to do to us (*Lev.* 14. §§4–5: 92; 15. §35: 109). Given these two general precepts, it is easy, on the basis of our common knowledge of the anti-social tendencies in human nature, to understand what particular rules have to be adopted. Hobbes spelt out close to twenty of them in chapter 15, without claiming completeness. For example, we should not show hatred or contempt for others; we should not arrogantly claim more than our share; we should be fair and impartial when our task is to decide a dispute.<sup>12</sup> By observing these rules people can live with others peacefully in pursuit of their diverse projects.

These precepts are laws of nature but only in the sense that they are rationally grounded ‘theorems’. But a law properly so called is ‘the word of him, that by right hath command over others’. Considered as God’s commands, delivered in His word, these theorems can be regarded as laws (*Lev.* 15. §41: 111).

#### (p. 485) **20.2.4 Competitors to Natural Law**

Alternative sources of norms, competing with those founded in reason, were found in scriptural revelation (preferred by some orthodox theologians but also by Selden) or direct inspiration (favoured by sectarian enthusiasts). Others found a non-religious source of many norms in custom and especially the Common Law, much revered: ‘an authority more ancient, and therefore more sacred, than that of any positive statute’ (Sanderson 1647: 16). Appeals to ‘the known Lawes and continued unquestioned customes of the severall Kingdomes in former times’ could carry more weight than appeals to reason and nature.<sup>13</sup> However, increasingly from the 1630s, ‘the appeal to the past was abandoned for the appeal to reason’.<sup>14</sup> The rivalry between these two was never a purely theoretical exercise, but part of the politics of the time.<sup>15</sup> Hobbes’ comment is instructive. He complained of the ignorance that

disposeth a man to make Custome and Example the rule of his actions, in such manner, as to think that Unjust which it has been the custome to punish, and that Just, of the impunity and approbation whereof they can produce an Example, ... they appeale from custome to reason, and from reason to custome, as it serves their turn; receding from custome when their interest requires it, and setting themselves against reason, as oft as reason is against them: Which is the cause, that the doctrine of Right and Wrong, is perpetually disputed, both by the Pen and the Sword. (*Lev.* 11. §21: 73–4)

### **20.3 Natural Rights**

The theories considered so far take the precepts and our obligation to comply with them to emanate from something external to the individual: the order of nature, the demands of reason, the will of God, or some combination of these. A different conception was, however, emerging in our period: a concept of obligation emanating from the will of the individual. It is sometimes said that what was new was a conception of a human being as a bearer of rights. This characterization can mislead. For one thing, there was nothing particularly new about the idea that people have rights and corresponding obligations. It is more helpful to identify the (p. 486) emerging conception as one of individuals, by nature free and equal, each having by nature a sovereign realm, and each being able to create obligations, moral bonds, by means of willing it.

This ability of individuals could explain the authority of kings and other earthly rulers. Their authority would otherwise be very hard to explain, because of its incompatibility with the inborn natural freedom and equality of all men, which was widely



accepted as axiomatic in seventeenth-century political theorizing. The explanation now available was that the authority of rulers, its scope and limits, was ultimately to be derived from the authority that each individual by nature had over his own sovereign realm. By performing a volition the individual could place himself under an obligation.

### 20.3.1 Radical Opinion

Richard Overton, a leading Leveller, wrote in the pamphlet *An Arrow Against All Tyrants*:

all men are equally and alike borne to like propriety, liberty and freedome ... Every man by nature being a King, Priest and Prophet in his owne naturall circuite. (1646: 3–4)

Everyone is innately *sui juris*. Popular consent, a grant from every individual, is the only legitimate foundation for political authority.

The consequences that Overton derived from such principles were radical: popular sovereignty and the abolition of monarchy, as well as freedom of conscience and religious tolerance, extending even to Roman Catholics. In the Parliament, he opposed Presbyterian bigotry.<sup>16</sup> In the same spirit, though not a Leveller, Anthony Ascham wrote of

the lawfulness and transcendent right which we have both by God and Nature in ourselves and that which is ours. (1649: 1. 7 §1: 31; Wootton 1986a: 340)

He also mentions ‘the right and liberty we have naturally in our own actions’. The very same sentiments appear in Locke’s *Two Treatises*.<sup>17</sup> They were not new then. (p. 487) They had been frequently invoked in the Putney debates in 1647 (Woodhouse 1974: 88) and in the flood of pamphlets and books published at the time.

### 20.3.2 The Individual in the State of Nature

So it is useful to begin with Grotius, precisely because his major work *De jure belli ac pacis* (1625), which soon became well known and frequently cited by scholars and politicians in Britain, articulated these concepts which even then had been current for quite some time.<sup>18</sup> In outline, his view was that in the natural state of freedom and equality, some kinds of actions affecting another person would constitute a wrong (*iniuria*) and be impermissible. The use of force against the wrongdoer would not constitute a wrong, but be permissible. This is the basic assumption of the just war theory that Grotius presents in the first two books of his major work. (The third deals with what is just or unjust *in* war.) The actions that constitute a wrong all have one thing in common: they are attacks on an individual and his own (*suum*), which comprises life, limb, liberty (i.e. one’s own actions), sexual integrity, honour, and reputation; in one passage he adds the things necessary for one’s safety (JBP 1.2.1.5; 2.17.2.1). Promises and contracts can add or subtract items from the original inventory of a person’s own.<sup>19</sup> Possessions can then be included, and so can rights. New kinds of wrongs then become possible, such as theft and non-payment of a debt.

Changes in a person’s own come about principally by promising. A promise is a declaration of will. The operative element is the volition: if we were mind-readers, the declaration would not be needed. A promise proffered and accepted results in an alienation of a part of one’s natural liberty, that is, the power over one’s own action is thereby transferred from oneself to the other party. Power thus transferred is called a right. The right is in relation to the promisor, who is now said to be under an obligation to the right-holding promisee. No other natural mode of coming under an obligation is conceivable (JBP Prol. §15). Originally, there are no rights (in the sense of powers transferred) or obligations correlated to them.<sup>20</sup> In a different sense of ‘right’, everyone has an inborn right, in the sense in which a person has natural freedom, autonomy, that is, power (in a normative sense) over his actions. Grotius’ expression is *qualitas* or *facultas moralis ad aliquid iuste agendum* (cf. JBP 1.1.4). Here, *iuste*, i.e. lawfully, cannot plausibly be understood (p. 488) to mean *rightly*. The meaning must be *validly*, i.e. that the person is able to bring about a normative effect, typically an obligation for himself or for someone else.

A number of authors had presented similar accounts of promising. Lessius’ (1554–1623) was only slightly different (Lessius

1606: 2. 18. Dub.5. §§28–33). In his account, too, the promisee's right and the promisor's obligation spring into being as a result of certain volitions. But he did not introduce any explicit idea of transfer.

### 20.3.3 The Use of Force

An injury (*iniuria*), i.e. a wrong, consists in trespassing on any of that which is a person's own. The concept of *iniuria* is important, because *iniuria* alone justifies the use of force. An *iniuria* makes the use of force against the offender permissible. The 'right' to use force, in this attenuated sense of 'right', only means that no wrong is committed by using coercive measures against the offender.

The purpose of coercive measures could be defence, restraint, restitution, or compensation. But opinion was divided on whether there could be punishment in the state of nature. Hobbes and Pufendorf were among the many who took it for granted that there cannot be any, for only a superior can punish, and in the state of nature all are equal.<sup>21</sup> Grotius and others, including Suárez, disagreed, and could then justify punitive wars.<sup>22</sup> Cumberland was of the same opinion, writing of 'the *Punishments* which any *Man*, in a State of Nature, has a Right to exact from the Transgressor of Nature's Laws' (TLN 1 §26: 335), but—perhaps not entirely consistently—he rejected as absurd the idea that inferiors can punish superiors, so the supreme power in a political society is not liable to punishment, except, of course, by God (TLN 9 §7: 716).

Locke did not find this absurd. He argued that in the state of nature everyone has the right to punish an offender against the law of nature, on the grounds that such an offender is a danger to mankind, and everyone has a duty, imposed by God, to preserve mankind (TT II §§6–13). The exercise of the right is then the fulfilment of a duty.<sup>23</sup> Locke maintained that there is a right to depose and punish a tyrant. He added that this would no doubt seem a very strange doctrine to some men (TT II. §9). Why 'strange'? The question has been much discussed (see e.g. von Leyden 1981).

Attempting to answer this question, Laslett (TT: 96) accepted Leo Strauss' mistaken view that there is on this point little difference between Locke and (p. 489) Pufendorf, but suggested also that Locke used the word 'strange' in order to signal that his doctrine of punishment was a novelty (TT II. §9: n. 1). This cannot be right. Locke and his readers knew that it was not a novelty. The opinions of Suárez, Grotius, and Cumberland were widely known, and the same view had been advocated by Milton (Milton 1991; Dzelzainis, Intro. to Milton 1991: xvi, xxv) and other radicals, like Edward Sexby, the sometime Leveller (Wootton 1986c: 42) who, after supporting Cromwell, turned to plot his assassination. It is likely that Locke used the word ironically. What might seem strange at first sight and hence surprising to the gentle reader was not the well-known doctrine itself, but the author's temerity in reviving it.

### 20.3.4 Four Elements in the Theory

Returning now to the theory in which the key concepts are (i) *suum*; (ii) *iniuria*; (iii) promises, understood as volitions which make rights and obligations come into being; (iv) the impermissibility of force except in response to *iniuria*: Grotius saw the theory built around these key concepts as a theory of justice in the strict sense. His theory has been called 'minimalist', but even if JBP was obviously not designed to cover all of morality, he firmly rejected the idea that moral demands are confined to the demands of justice in the private or the public sphere.<sup>24</sup>

In this theory, the *suum*, together with the power of volitions to produce rights and obligations, is natural, in the sense that no superior authority is needed to ordain it all. In a theistic perspective, they result from God's creative rather than legislative activity. They can be thought of as features of the world at large, neither physical nor mental, but normative, and, as Grotius wrote (JBP Prol. §11), they are conceivable even if *per impietate* no god is supposed to take an interest in the world.

It is presupposed that prior to any transactions, all are free and equal. Obligations imply unfreedom and inequality. So there is initially no *obligation* to abstain from that which belongs to someone else,<sup>25</sup> even if failure to do so is an *iniuria*. An obligation to observe the precepts of justice in the state of nature would come into being only if imposed by the will of a superior, i.e. God. On that assumption, a debtor in the state of nature would have two obligations: one to the creditor, one to

God.

(p. 490) How great a part of one's liberty could a person alienate? All of it, according to Grotius: self-enslavement is possible. On this particular point, many of those who otherwise admired his work disagreed, and held, for various reasons, that such a contract would be invalid. Locke, for instance, maintained that a person could enter into service, but not servitude, which, he argued, would be self-destruction and violate the God-imposed duty to preserve ourselves.

### 20.3.5 Locke

The most famous proponent of a 'rights theory' is of course Locke. The concept of *suum* (Locke uses the word 'property') plays a central part. It includes initially life, liberty, health, limb. Goods come later, after acts of acquisition, be it original (by labour), or derivative (by agreements, inheritance, etc.).

As far as justice is concerned, the 'property in' all that is part of a person's realm, including his life, is to be understood to mean that since his life is part of his 'own', attacks on it constitute a wrong, and the use of force for defence, restitution, or punishment is permissible. In short, the 'right to life' means that an attack on a person's life is an *iniuria* and that the use of force in response is permissible. But as noted above in discussing the alleged 'minimalism', the theory of strict justice need not, and in Locke certainly does not, provide all the norms for human action.

The way Locke brings in God's law into his theory creates some problems. The standard view allows for 'one's own' and related rights to make sense even without assuming a divine legislator. In addition, it could be assumed that God wills that they be respected. But according to Locke, God imposes also a duty on oneself to preserve oneself. In his view, there is both a right to protect and defend one's own, and a duty to do so. This is different from the standard theory which does not make the use of force in state of nature in defence of one's own obligatory; the theory is merely that such defence is not wrong. The upshot is that the 'natural rights' in Locke are not optional, and are derived from duties imposed by God: certain actions are permissible simply because they are duties. At least this is how Locke is often interpreted. 'In a condition of natural equality ... the rights we have are derived from our duties under natural law to preserve ourselves and other men' (Stanton 2008: 51). 'For both Lawson and Locke ... absolute subjection is due only to the omnipotent divinity; all rights *stem from* duties to God' (Condren 1989: 181, emphases supplied). This sounds as if every right to do x is *generated by* a duty to do x, which immediately implies that nothing is optional and that there is no right to do *anything* unless it is a duty. Similarly, other writers also link the concepts of the mandatory and the permissible: MacFarlane (1970: 146) writes that liberty is for (p. 491) Locke a matter of being free to do what you ought to do, and according to Sterba (1978: 116) Locke defines liberty as the activity of doing what one ought.<sup>26</sup>

In contrast, Stillingfleet (1662: 1. 1. §2: 7–8) represents sound common sense: 'non-prohibition is warrant enough to make any thing lawful'; 'where there is not a particular command and prohibition, it is in nature and reason supposed that men are left to their natural freedom'. Hobbes thought likewise (*Lev.* 21. §18: 143).

However, the divine commands, and the arbitrary power that a potter has to destroy a vessel he has made, which are introduced by Locke in the 'Second Treatise' in order to explain their authority, can in fact be detached and left aside with remarkable ease from his theory of the natural freedom, equality, and natural sovereign realm of every individual, and this explains why he has been regarded as a founding father of theories of rights and liberal political theory, which have often been entirely secular.

### 20.3.6 Hobbes

Hobbes used the same concepts (i) *suum*; (ii) *iniuria*; (iii) promises, understood as volitions whereby rights and obligations come into being; (iv) the freedom to use force only in response to *iniuria*. And yet, his theory of the rights of individuals in the state of nature, and of subjects and rulers in civil society, is markedly different from the standard outlook presented so far. Most of the dissimilarities are due to exactly one principal point of difference. It is his declaration that there is no *suum*

by nature, but only by the will of the sovereign. In man's natural condition, there is 'no Propriety, no Dominion, no *Mine* and *Thine* distinct' (*Lev.* 13. §13: 90).

The natural freedom to act does not, then, have a natural boundary of the kind envisaged in the standard outlook, a boundary defined by that which by nature belongs to other individuals. On the standard view, but not in Hobbes' view, the right to act has limits and there is a difference between liberty and licence. In the state of nature individuals may be in violent conflict, but the three concepts of *iniuria*, 'dominion' (authority over others), and 'mine and thine distinct' (ownership of goods and land) do not apply.

This makes for a different account of how obligations come into being in the state of nature. Hobbes agrees with the standard view that obligations come into being by an act of will (*Lev.* 14. §7: 92). But they cannot result from a *transfer* of a part of one's liberty, as in Grotius, for whom what is transferred is part of a person's own. In Hobbes' theory, there is no own in the state of nature, so that description (p. 492) does not fit. Promises are truly creative.<sup>27</sup> They bring into being bonds between two parties such that one has a right, the other an obligation. The bond is an *emergent* relation, created, in a sense, *ex nihilo*. Hobbes may have had this in mind when he wrote:

the *Pacts* and *Covenants*, by which the parts of this Body Politique were at first made, set together, and united, resemble that *Fiat*, or the *Let us make man*, pronounced by God in the Creation. (*Lev.* Intro. §1: 9–10)

Hobbes is influenced by the standard conception and describes promises as transfers, or renunciations, of one's natural liberty, but there is also another reason why this description does not apply to his own theory. He defines the liberty, one's freedom of action, as the absence of external impediments (*Lev.* 14. §2: 91), or as the absence of obligation. But a transfer or renunciation of an *absence* does not really make sense. In fact, in Hobbes' theory a promise, the willing of an obligation, brings something new into existence. The willing is genuinely creative.

Since there is no natural *suum*, there is no such thing as injury or injustice in the state of nature. These concepts only apply once obligations and correlated rights have been created. As it happens, in Hobbes' theory, genuine peace-seekers will create rights for the sovereign peacekeeper, and place themselves under obligations. For the sake of peace, he argues, the authorization must be irrevocable and complete.

This will not prevent grievances from emerging. Dissatisfied subjects may complain that they are being unjustly treated when a tax is levied without their consent, when a monopoly is licensed to overcharge them, when a prohibition against conventicles offends their religion, when huge public funds are squandered on unworthy royal favourites—the ways of misgovernment are countless. Hobbes was well aware of that, but his reply to such complaints is that they are misguided: *iniquity* there may be, but no *injustice*. This is, of course, small comfort and sounds like a mere play with words. But it shows that Hobbes on this point agrees with the standard theory, and regards it as axiomatic that injustice or injury, regarded as synonyms by him, alone justifies the use of force.

Nevertheless, Hobbes does not maintain that all resistance to a sovereign is wrong. Nobody can be supposed to have authorized the sovereign to create conditions in which life become unbearable or is brought to an end, since the sovereign authority was set up for the sake of protection (*Lev.* 14. §8: 93). The conflict that arises from resistance is of the same kind as in a state of nature. The violence is against a threat or an attack, not against a wrong.

(p. 493) The standard concepts of one's personal realm, i.e. the *suum* and related concepts such as injury or injustice, and their opposites, are, however, present in Hobbes' theory, though with a most important modification:

Again, every Sovereign Ought to cause Justice to be taught, which (consisting in taking from no man what is his) is as much as to say, to cause men to be taught not to deprive their Neighbours, by violence, or fraud, of anything which *by the Sovereign Authority* is theirs. Of things held in propriety, those that are dearest to a man are his own life, & limbs; and in the next degree, (in most men,) those that concern conjugall affection; and after them riches and means of living. (*Lev.* 30. §12: 235–6; emphasis supplied)

The concepts employed (one's own, injury, justice) are the standard ones: 'Where there is no *Own*, that is, no Propriety, there is no Injustice' (*Lev.* 15. §3: 101).<sup>28</sup> But there is a decisive difference from the standard view. The things 'held in propriety' are not one's own *by nature*, but *by sovereign authority*. The quoted statement does, however, generate serious problems. One is that sovereign authority determines what is a man's own, but cannot really determine what is 'dearest to a man'. The question is what to think about the discrepancies between the two.

Interpreters disagree on Hobbes' view of the binding force of promises. It would seem that he believed in it. The obligations they create bind in conscience, but bind externally, i.e. to fulfilment, only if fulfilment would not endanger one's security (*Lev.* 15. §36: 110). He also believed that most people fulfil their obligation for fear of sanctions; but that a nobler motivation can be found in a few men (Hobbes 1969 [1640] 16 §4; *Lev.* 15. §10: 104). There are, then, obligations that are acknowledged, independently of any fear.

Moreover, the assumption that promises bind is also behind his theory that going back on one's word is akin to absurdity: *willing now to do F at a certain future time and not willing at that time t to do F* (*Lev.* 14. §7: 93). This is not so. There is nothing absurd in changing one's mind. But Hobbes identifies the first with a promise, and the second with non-fulfilment of the promise. And the reason why there is something untoward about that is, of course, that the first willing, the promise, creates an obligation which is not cancelled simply by changing one's mind.

On the other hand, there are also statements in Hobbes which suggest that without fear of the 'sword' of the sovereign, there is no obligation (e.g. *Lev.* 15. §3: 100–1). The reference to desires, hopes, and fears is seen by Irwin as part of a general attempt of Hobbes to reduce normative concepts such as obligation to mental and physical ones. The morally necessary becomes psychologically necessary.<sup>29</sup>

(p. 494) This way of interpreting Hobbes' theory comes close to seeing it as a precursor of the legal positivism of John Austin (1964 [1832]: 164). Still, a difference seems to remain: in Hobbes, the sovereign has authority, a right to rule, and not mere might, as in Austin's theory.

The related notions of one's own, *iniuria*, the principle that only *iniuria* makes the use of force permissible, the principle that promises and nothing else create obligations—these are significant points of affinity between Hobbes and the standard view. And it certainly would seem that the differences between the two are on the whole due to one single, though fundamental claim: that 'one's own' is determined not by nature but by the sovereign. Hobbes' design was to show not only the necessary conditions for peaceable, sociable, and comfortable living, but also how they can come to obtain. A monopoly of organized force is needed. But his theory retains the idea that whoever controls this monopoly does so by right.

There is wide consensus that Hobbes was prepared to sacrifice too much for the sake of peace (Austin 1964 [1832]: 276–81). Many have agreed: '[Hobbes] believes that peace is worth any price' (Irwin 2008, 2: 173), Springborg (2010) emphasizes Hobbes' making citizens into servants or slaves. Tarlton's condemnation (2001) is very harsh. Diametrically opposed to this are quite a few monographs (e.g. Lloyd 2009; Zagorin 2009; Gert 2010), which also take exception to Hobbes' version of absolutism, but on the whole find Hobbes' theory making excellent sense both morally and politically.

## 20.4 Conclusion

It was often assumed, both at the time and since, that rights are secondary: they depend for their existence on being granted, conferred, conceded by law. Nevertheless, the reverse is arguably closer to the truth. One reason for assigning conceptual priority to rights is that there can be no obligation, imposed by law, to respect rights unless there are rights to be respected. Another reason is that laws properly so called have binding force only if issued by someone with legislative authority, that is, the right to legislate.<sup>30</sup>

The individual's natural sovereign realm is a metaphor—literally, sovereign realms belong to kings or emperors. What was

new in a main current of (p. 495) seventeenth-century thought was a kind of conceptual trickle-down, by which, in the state of nature, every individual is a king.

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## Notes:

- (1) In Britain, the revival of Stoicism through Lipsius had some impact, e.g. in Cumberland, but was not a major influence. See Kraye 1998: 1289.
- (2) The full statement is in Cicero, *The Republic*, 3. 22 (33).
- (3) Books 1–4 were published in 1593, Book 5 in 1597, Books 6–8 about half a century later.
- (4) JBP 1.1.11.1: *ius* (here: law) is only for those capable of general precepts. ‘*Ius*’ is ambiguous. It can mean law, as in *ius civile*, *ius naturae*, or a right, something that belongs to a person.
- (5) The Socinians, so called after Fausto Sozzini (1539–1604) were a Unitarian sect. Their denial of any scriptural or other authority for the doctrine of the Trinity led to frequent persecutions.
- (6) If the precepts of natural law cannot be naturally known, all those without the benefit of revelation and therefore ignorant of them are without guilt and consequently without any need of salvation.
- (7) Anstey (2006 1: 9) notes the central significance of Thomas Burnet’s (c. 1635–1715) question to Locke, ‘What is the reason or ground of divine law?’ (Burnet 1697: 6).
- (8) ‘Live honourably, harm nobody, let each have what is his’ (Ulpian, *Inst.* 1.1 3; *Dig.* 1.1.10.1.). This is Stoic philosophy rather than Roman jurisprudence.
- (9) The influence of Aristotle is obvious, but the list also includes items not regarded as virtues by him. For a remarkably lucid presentation of Aristotle’s list, see Bostock 2000: 46f.
- (10) As noted above, he soon became diffident about the prospect.
- (11) For a survey of the content of ethics courses in seventeenth-century Britain see Schobinger 1988: 1–18.
- (12) The importance of some of the causes of quarrel remains broadly the same over time. For other ones, their importance can change over time. For instance, the lack of judicial integrity and impartiality was a more serious problem in Britain then than now (Prest 1986: 304). It was natural for Hobbes to select it for mention.
- (13) Hume (1983 [1778], 6: 173). For praise for the Common Law, ‘the common custom of the realm’, see Sir John Davis *The Primer Report*, quoted in Wootton 1986a: 131ff.
- (14) John Hare spoke of ‘that general and inbred hatred which still dwells in our common people against both our laws and lawyers’, and the leading Levellers (Overton, Lilburne, Walwyn, John Warr) agreed (Hill 1986: 80, 104).
- (15) Wootton 1986b: 10 presents a fine account of the contextualist approach to understanding past political thought.
- (16) See Gardner 2000, 2: 621–3; Brown 2008: 53; Zagorin 1966: 22.
- (17) Laslett’s research and text-critical edition has been described as ‘one of the major achievements of Locke scholarship in the twentieth century’ (Milton 2007: 89). He made the remarkable discovery, presented in 1960 in the introduction to his edition of Locke’s *Two Treatises* (see Laslett Intro. to TT), that the work had not, as commonly supposed, been written to

## Women, Freedom, and Equality

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### Abstract and Keywords

This chapter, which examines the conception of equality and women's freedom in the field of philosophy in Great Britain during the seventeenth century, analyzes the works of Margaret Cavendish, Duchess of Newcastle and Mary Astell, who wrote about feminist issues, the nature of liberty, and equality for women. The analysis of a variety of writings reveals that seventeenth-century women were politically aware, took an interest in political affairs, and were conscious of their position as women within the social and political order of their time.

**Keywords:** equality, women's freedom, philosophy, Great Britain, Margaret Cavendish, Mary Astell, liberty, politically aware, political affairs

IN the seventeenth century, women were legally defined as minors and routinely denied the opportunity to study, never mind become experts in jurisprudence or political theory. The professions were not open to women, and with the exception of queens, women could not hold political office (Maclean 1977, 1980). The opportunities for political discussion available to men were also closed to women. It is therefore not surprising that the evidence for women making any kind of sustained contribution to political theory is very limited—even on a relaxed definition of what constitutes political thought. However, the political upheavals of the period thrust women into roles they would not have taken on in normal circumstances, and the development of print culture brought new and increasing opportunities for women to publish. This was also a period which saw the development of new philosophies, proposing new ways of thinking about politics, metaphysics, and natural philosophy in place of the Aristotelian synthesis which had formed the backbone of European philosophy since the Middle Ages. Although they were not directly concerned with the position of women, the philosophies of Descartes, Hobbes, and Locke brought fresh perspectives on received views about women's freedom and equality, and, in their turn laid the ground for future controversies. The two women with whom my discussion will be largely concerned published in these political and philosophical circumstances. (p. 502) Margaret Cavendish, Duchess of Newcastle (1623–1673), and Mary Astell (1666–1731), both published significant quantities of writing, and are distinctive by virtue of the fact that they were centrally concerned with feminist issues, the nature of liberty and equality for women. Their work is also distinguished by their engagement with contemporary philosophy, in order to frame and discuss these and other topics. However, they did so in distinctive, and, in many respects, unexpected ways.

A variety of writings show that seventeenth-century women were politically aware, that they took an interest in political affairs, and that they were conscious of their position as women within the social and political order of their time.<sup>1</sup> A famous early example is Lady Anne Clifford (1590–1676) who campaigned for her entitlement, as the sole surviving heir of the body of her father, to inherit the titles and estates of her father, and to hold public office. Her 'Great Books' document her role as an aristocratic landowner and local magistrate, presenting the evidence of family precedent (Graham et al. 1989: 33–49).

There were many cases where the exigencies of Civil War forced atypical roles on women, for example, Lady Brilliana Harley (c. 1598–1643), who defended her husband's fortified home at Brampton Bryan during a siege by Royalists (Eales 1990; Harley 1854). Her experience of warfare and her resolve to defend her own home are recorded in the letters she wrote to her husband. Other evidence of women's political awareness is to be had from petitions to Parliament. One such was Elizabeth Lilburne, wife of the Leveller leader, John Lilburne, whose petition to the House of Commons for the release of her husband appeals to MPs as defenders of the 'Lawes, Liberties, and Freedomes of the people' which are 'the COMMON BIRTHRIGHT OF ENGLISH-MEN, who are all borne equally free', the meanest as well as the greatest (Lilburne 1646). There were many cases of women who were inspired by their faith to comment directly on political affairs, while the demands of others (such as calls for toleration or the abolition of tithes) had implications for social and political relations. The Quaker Mary Cary (aka Mary Rande, *fl.* 1647–1653) had political and social reform in view in her *Twelve Humble Proposals* (1653) which she presented to Parliament, calling for reforms such as the abolition of tithes, the reorganization of London parishes, and reform of the universities so as to improve the training of the clergy (Broad and Green 2008: 168–9). Although these documents testify to women's political activity and in some cases can be taken to indicate a political position (Smith 1982), they were not theoretical. Neither Anne Clifford nor Brilliana Harley is the purveyor of political argument—Lady Clifford's methodology, for example is legal, largely consisting of cumulated evidence to support her case (Lewalski 1993: 126). In her defence of her husband's property Lady Brilliana, arguably, acted as a good wife rather than as her husband's equal in political affairs. There is no indication that women are among the 'people' to whose birthright Elizabeth (p. 503) Lilburne refers in her petition, which is grounded on her position as godly wife, not as freeborn citizen. Furthermore, the motivations of many women being as often as not primarily religious, the freedoms which they demanded were largely within the religious sphere. They did not explicitly challenge sexual inequalities, or base their demands on parity with men.

The first significant sustained case for gender equality in the seventeenth century was made by a man, François Poulain de la Barre (1647–1723) (Stuurman 2004). Poulain's *De l'égalité des deux sexes*, which was published in Paris in 1673, was soon translated into English and published in London in 1677. *De l'égalité* was radical in two important respects. First, it broke with social and political customs which treated women as inferior to and dependent on men. The other sense in which the book was radical was its abandonment of the traditional philosophical underpinnings of sexual inequality. Before the seventeenth century, the dominant form of philosophy was scholastic Aristotelianism, which provided the theoretical framework for civil and ecclesiastical law, and all branches of philosophy. The philosophical arguments for the subordination of women enshrined within scholastic philosophy drew on Aristotelian ideas that women are essentially inferior to men (Maclean 1980). Poulain, however, turned to the new philosophy of René Descartes to develop an argument for the equality of the sexes. Poulain's position is founded on the Cartesian view of the mind as ungendered. Taking as his starting point the Cartesian epistemological method and the criterion of clear and distinct ideas, he argued that sexual inequality results from prejudice and custom. The method he adopted involved

applying the rule of truth: to accept nothing as true unless it is supported by clear and distinct ideas. And thus we find that the common prejudice is founded on mere popular heresay, and that the two sexes are equal. (Poulain 2002: 50)

Poulain proceeded to argue that the only impediments to female attainment are male obstructiveness and misogyny, which are reinforced by pedantry and erroneous education. By contrast with educated men the uneducated woman has the advantage that her head has not been filled with the wrong thinking instilled by education. Although the equality for which Poulain argues is intellectual equality, its consequences are social and political: were it not for the prejudices of custom, women might become jurists and wield political power exactly like men. In the sequel, *De l'éducation des dames* (1674), Poulain proposed a partial remedy to the intellectual inferiority of women by setting an educational programme for women. Part of the importance of Poulain's *De l'égalité* is that it shows how a new philosophy could offer new ways of thinking about relations between the sexes. As my two main examples of seventeenth-century feminism show, Cartesianism certainly did not have a monopoly here (Cavendish was anti-Cartesian, though Mary Astell could be called a Cartesian of a sort) but Poulain's use of Cartesianism is one example of an alternative to arguments based on Aristotelianism. Another (p. 504) point to highlight is that Poulain's Cartesian sense of intellectual equality resonates with the notion of *mental liberty and equality*

which is a distinctive strand in seventeenth-century feminist thought.

The Cartesian notion of equality of mind was not the only version of gender equality available in the seventeenth century. The two philosophers with whom Margaret Cavendish and Mary Astell engaged, Hobbes and Locke respectively, also, in different ways, posit equality of the sexes. By virtue of the social opportunities Poulain's conception opens up for women, his is a much richer idea of equality of mind than is to be found in other philosophers. Hobbes, for example, recognizes equality of women in the state of nature, but not in the commonwealth. With Locke, too, a theoretical possibility of gender equality and actual advocacy of educational equality does not translate into political freedom, or significantly alter the customary hierarchy of the sexes.

## 21.1 Margaret Cavendish

Margaret Cavendish discusses gender relations and women's experience across the range of her diverse writings, but her most explicit political statements are contained in *Sociable Letters* (1664), *Orations of Divers Sorts* (1662), her utopian *A Description of a New World Called the Blazing World* (1666), and also in *The Worlds Olio* (1655). Her political observations reflect her experience as a royalist closely connected to the inner circle of the court, first as Lady in waiting to Queen Henrietta Maria, and then as wife to the exiled royalist grandee, William Marques of Newcastle. Many of her political essays are on topics related to war and civil disturbance, featuring mutinous soldiers and rebellious citizens, with titles such as 'An Oration to Prevent Civil War' or 'An Oration from a Besieged City, ready to yield or else be taken'. Together these observations can be read as an analysis of the ills that brought monarchy to its crisis in the 1640s, and as advice for securing peace in the future. The most significant political theorist in the royalist circles in which Margaret Cavendish moved was Thomas Hobbes, of whom her husband and brother-in-law, Charles Cavendish, were patrons. Despite her denials, Cavendish certainly had contact with Hobbes and knew his writings, which she discusses in *Philosophical Letters* (1664). Although, as we shall see, there are important differences between Margaret Cavendish's political philosophy and Hobbes', there are also affinities, especially her conception of monarchical absolutism, her view that the monarch is protector of the liberties of individual subjects, and that freedom is contingent on strong authoritarian government. Another point of agreement is that they both regarded men and women as equals in their original state. A major (p. 505) difference from Hobbes is her discussion of the conduct and position of women in society, especially what she calls 'the liberty of women'. This is a topic which she discusses chiefly, though not exclusively, in her *Orations*, which contain a set of seven 'Female Orations' and two orations on 'Liberty of Women' (Cavendish 2003: 127–8). Despite her statement that men and women 'were made equal by Nature', she nevertheless accepts hierarchical ordering of society, and the subordination of wives to their husbands.

Evaluating Margaret Cavendish's political thought is complicated by her habit of adopting speaking personae through which she refracts her views in such a way that it is difficult to pinpoint her personal position: 'I speak *pro* and *con* and Determine nothing' as she declares in *Sociable Letters* (Cavendish 1664b: sig. c3). This classic strategy for dissembling one's own views was popular with (but by no means exclusive to) libertines or free thinkers. Cavendish's use of it is an indicator of how close she was to the dangerous currents of actual political events. Her earliest political pronouncements were published in London shortly after the establishment of Cromwell's Protectorate: remarkably, her *Worlds Olio* (1655) discusses such hot topics as the causes of rebellion, tyrannical government, hereditary monarchy, and usurpers, as well as proposing a monarchical model of government ('The Inventory of Judgements Commonwealth'). Her adoption of multiple voices was also a means of presenting views that would have been controversial for her own political class, such as her criticisms of monarchy (e.g. *Orations* 165 and 168). Her comments on the means for securing successful monarchy amount to an implicit indictment of Charles I for having failed to achieve military supremacy, control of the capital city, fiscal solvency achieved through taxation and promoting trade, control of opinions and beliefs.

Cavendish's views on women were no less controversial than some of her political utterances. For example there is no disguising the challenge to the status quo in the following charge that men have usurped power from women:



men from their first Creation usurped a Supremacy to themselves, although we were made equal by Nature, which Tyrannical Government they have kept ever since, so that we could never come to be free, but rather more and more enslaved. (Cavendish 1655b: sig A4)

She is similarly outspoken in calling attention to the educational disadvantages of women. For example, in her *Sociable Letters* (1664) she criticizes the education of gentlewomen:

for the most part Women are not Educated as they should be, I mean those of Quality, for their Education is onely to Dance, Sing, and Fiddle, to write Complemental Letters, to read Romances, to speak some Language that is not their Native, which Education, is an Education of the Body, and not of the Mind. (Cavendish 1664b: 50)

However, controversial utterances are frequently placed alongside opposing views: ‘An Oration against the Liberty of Women’ is followed by ‘An Oration for the (p. 506) Liberty of Women’. Her ‘Female Orations’ both condemn and defend women’s subordinate status, and argue for equality with men. One Oration complains that men are ‘unconscionable and cruel’ to women, but another declares that men do everything for women, whom ‘they adore and worship’. Women, she says, may be less free, but they are better off than men, ‘if men have more liberty, women have more safety’ (Cavendish 2003: 248–51). In *Sociable Letters*, Cavendish turns restrictions on female political participation into a statement of female freedom from male rule:

And as for the matter of Governments, we Women understand them not, yet if we did, we are excluded from intermedling therewith, and almost from being subject thereto; we are not tied, nor bound to State or Crown; we are free, not Sworn to Allegiance, nor do we take the Oath of Supremacy; we are not made Citizens of the Commonwealth, we hold no Offices, nor bear we any Authority therein; we are accounted neither Useful in Peace, nor Serviceable in War; and if we be not Citizens in the Commonwealth, I know no reason we should be Subjects to the Commonwealth. (Cavendish 1664b: 27)

But it is typical of Cavendish that she concludes this passage by declaring women’s subjection to husbands: ‘And the truth is, we are no Subjects, unless it be to our Husbands’. This kind of equivocation makes it difficult to construct a coherent account of Cavendish’s views on women, and to square her feminist arguments for female ‘liberty’ with her arguments in favour of monarchy and social hierarchy. Taking our cue from her analogy between husband and monarch, we can perhaps draw some insights from her political philosophy, in order to understand how she reconciles the liberty of wives and subjects with political, social, and gender hierarchy.

## 21.2 Liberty of Subjects

Prominent among the topics which Margaret Cavendish discusses in her political writings are the rights and duties of kingship, problems of disorder and rebellion, and questions regarding the liberty of subjects. Despite the criticisms she expresses of the role of the monarch in precipitating the Civil Wars, Cavendish was a staunch supporter of absolute monarchy. Perhaps her most unequivocal recommendation of autocratic monarchy occurs in a work of fiction, her *Blazing World* where the eponymous character, the Duchess of Newcastle, counsels a restoration of monarchy, on the traditional early-Stuart English model, with ‘one sovereign, one religion, one law, and one language, so that all the world might be as one united family without divisions’ (Cavendish 2003: 87). A major theme of Cavendish’s political writing is the maintenance of order and peace. Since security and stability (p. 507) are preconditions for prosperity which, in turn, is important for winning the loyalty of citizens, a fundamental duty of the state is to guarantee security. Although she discusses alternative modes of government (democracy, aristocracy, and mixed monarchy), she evidently thought that the best way to achieve security is through absolute monarchy. She supports this view partly by traditional arguments: monarchy is both customary (‘a government which our forefathers chose for the best’) and sacrosanct, absolute monarchy mirrors the divine (‘which government, king and power is a type of Heaven, God and his omnipotency’) (Cavendish 2003: 280–1). But her justification

of monarchy is also in many ways pragmatic: the advantage of monarchy over other forms of government (e.g. democracy or aristocracy) is asserted to be its unitary character: a single ruler provides a single focus for loyalty. Alternative systems of government are, almost by definition, liable to self-destruction from the dissension that is bound to arise from multiple, and therefore, competing allegiances. In *Blazing World* the Duchess justifies autocratic monarchy in terms of the practical objective of maintaining peace, which will be achieved through creating unity ‘without divisions’. In the interest of securing peace and stability, the policies she recommends focus on maintaining security and outlawing practices which threaten to destabilize political harmony. Military strength is therefore a prerequisite, as is regulation of belief and opinion. It follows, therefore, that the ruler should dictate the religion of his kingdom, proscribe dissent, and discourage freedom of expression. The benefit for citizens is protection of their liberties, but liberty is only possible within the context of the constraining power of the monarchy. In ‘A King’s speech to his rebellious rout’, in *Orations*, the king declares,

if every one hath Liberty to do what he list, not any man will have Power to do what he would; for Liberty would be lost, if every man will take upon him to Rule, and confusion will take place of Government. Thus striving for Liberty, you will thrust your selves into Slavery and out of ambition to rule ye will lose all government. (Cavendish 2003: 196)

Cavendish here expresses an essentially Hobbesian view that the liberty of the subject is contingent upon the superior right of the monarch. However, a major difference between Cavendish and Hobbes is in their assessment of how power should be exercised. Cavendish takes the view that, while the sovereign must be prepared to use force when necessary, it is virtue, not force, which sustains the body politic. The successful monarch is a benevolent dictator, ‘careful and loving’ towards his subjects, impartial, honest, and honourable in his dealings. Such conduct will induce voluntary obedience on the part of subjects, by creating an indebtedness sufficiently strong to create an obligation to obey. To understand how this works, it is helpful to turn to Cavendish’s philosophy of nature, where the harmonious ordering of the physical world is explained by analogy with the body politic. The physical world, like the body politic, is constituted of diverse components, the free actions of which have huge potential to disrupt the harmonious (p. 508) ordering of things. But Nature, like the ruler of the body politic, operates in such a way that the constitutive parts of the natural world work harmoniously together. By exercising ‘wisdom and moderation’, ‘love and kindness, and good will’, Nature induces obedience. To rule ‘with love and kindness, ... and not violently by power and force’ brings about voluntary obedience (‘good will’). This sense of obligation to obey is a kind of voluntary determinism,

yet she [Nature] did govern them with such wisdom and moderation, that they were necessitated to obey her, and move according as she would have them; ... The like may be in some actions of Nature. Nevertheless, we do not deny but there is many times force and power used between particular parts of nature, so that some do overpower others; but this causes no disturbance in nature; for if we look upon a well-ordered government, we find that the particulars are often at strife and difference with each other, whenas yet the government is as orderly and peaceable as can be. (Cavendish 2001: 34)<sup>2</sup>

Autocracy, therefore, is compatible with individual liberty if exercised wisely and moderately. A ‘well-ordered government’ achieves order and peace, while being able to accommodate differences at a micro level.

## 21.3 The Liberty of Women

We have already noted Cavendish’s preoccupation with the problem of disorder, and the over-riding *desideratum* for peace and stability. Just as in monarchies peace and stability are vulnerable to disruptions by individual free agents, so within marriage female free agency has the potential to disrupt and destroy marital harmony. In marriage, as in monarchies, the autocracy which guarantees security, stability, and harmony is the guarantor of liberty of those subject to that power (i.e. wives). The price of freedom, therefore, is a measure of constraint: not only does it require obedience on the part of the wife, but it places limitations on how a woman may conduct herself—for example she is bound to exercise her liberty in a

manner appropriate to the condition of marriage (e.g. by being chaste within marriage). It can, of course, be objected that on this view, female freedom is nonetheless subject to restrictions—Cavendish uses the metaphor of caged birds (Cavendish 1655a)—and that these restrictions are imposed unequally on the two sexes. In consequence women have to make a virtue of necessity, and accept situations which, individually, are *prima facie* unfair, because they apply unequally to men and women.

(p. 509) But this situation is, arguably, mitigated by Cavendish's compatibilist view of the relationship of autocracy and liberty, particularly in the respects in which her conception of monarchical authority differs from that of Hobbes. As we noted earlier, Cavendish modifies the coercive model of absolute monarchy by appealing to a combination of humane and aristocratic values: up to a point, therefore, order is maintained by a coalition of goodwill between subject and ruler. The honour code which regulates this is one which obliges the strong to protect the weak, and the powerful to treat the disempowered with decency and fairness. According to this code of honour it is 'uncivil and ignoble' to speak against women. But this claim is rooted in the order of nature, where nature is understood to enshrine the social hierarchy that subordinates women to men. It is, she argues, 'unnatural, for men to speak against women and their liberties, for women were made by Nature for men' (Cavendish 2003: 247). The hierarchical relationship between men and women is mitigated by the love men bear women, which obviates a condition of slavery ('Should they make them [women] slaves, which Nature made to be their dearest associates?') (Cavendish 2003: 247). Thus, just as the well-ordered monarchy is sustained by the honour code so as to obviate the need for the ruler to use force, so also in marriage Cavendish mitigates subordination of wives to their husbands by invoking the behavioural codes appropriate to the class hierarchy of her day. In marriage, as in public politics, she apparently settles for benign absolutism. Women are free under the protection of their husbands.

To appeal to a man's sense of honour is, of course, no guarantee that he will behave honourably. Nor does it guarantee that demands of honour will not have harsh consequences. The best guarantee that a husband will conduct himself decently towards his wife is his recognition that for the maintenance of harmony and order, honour and self-interest coincide. The parallel with the public sphere holds exactly: for both husband and monarch, mere coercion is not a good method for securing order and stability. An example of how male self-interest and women's best interest coincide is female education. Treating one's wife well, in Margaret Cavendish's view, means treating her as rational agent. Rational creatures, being free agents, should be persuaded, not coerced. Cavendish's view that women are rational is predicated on her view of the gender equality of mind. However her argument in favour of developing women's minds through education is made, in part at least, on pragmatic grounds by appealing to male self-interest. Women, Cavendish claims, are also more susceptible to the influence of their passions than men, and therefore liable to be disruptive and disorderly. The best way to control the passions is through reason. In the essay 'Of Liberty of Women' in *Worlds Olio*, Cavendish argues that an 'honest education' is the best way to contain disorderly potential, and to limit the destructive consequences of libertinism and sexual licence:

(p. 510) to breed them with Sense and Reason, Knowledge and Understanding, or else Liberty is dangerous, especially amongst the Effeminate Sex, if they be not ballanced with wise Admonitions, to make them swim steddily and even through the World. (Cavendish 1655b: 74)

However, even if a husband practises benevolent rule, this does not actually change the fact that women are unequal in marriage, and must accept restrictions on their freedoms (the bird is still caged, but the cage is larger). Nor does it, of itself, make a wife's position tolerable since it does not solve the painful dilemmas which women face by virtue of their subordination to men. This perhaps explains why Cavendish's *Orations* include accounts of acute predicaments faced by women, for which no resolution is offered. Examples are the wife of an abusive husband and the widow inadequately provided for in her rich husband's will, for neither of whom recourse to law can alleviate their situation (Cavendish 2003: 178–81). One set of orations which illustrate the harshness of women's lot are the Funeral Orations for women which occupy Section VIII of Cavendish's *Orations*. For example, the 'Child-bed Woman's Funeral Oration' for a woman who died giving birth states that the natural condition of women is no better than their social condition. 'Nature', she writes, 'seems both unjust and cruel to her female creatures, especially women' because they must endure the pains and hazards of

childbirth, as well as the 'vices and wickedness' of men. Women are therefore 'more enslaved than any other female creatures ... wherefore those women are most happy that never marry, or die whilst they be young, so this young woman that died in childbed is happy in that she lives not to endure more pain or slavery' (Cavendish 2003: 226). It is striking, that, notwithstanding her somewhat idealistic faith in aristocratic courtliness, Margaret Cavendish does not gloss over the realities of gender subordination.

In the final analysis, there is no perfect solution to reconciling female liberty with marital and political order, except the one which is offered in Cavendish's utopia, *Blazing World*: to invest a woman with autocratic power. This is a solution which preserves the social and political order—it is consistent with Cavendish's view that queens are the only exception to the rule that women have no place in the world of politics. Furthermore, in the case of the Empress of her story, it involves no subversion of masculine social order, since the Empress' power is a free gift from her husband. It needs hardly be said that the Empress' liberty is not founded on equality—she is free as *dominatrix*, not as democrat. Like all utopias, *Blazing World* is an impossible dream of the possible—an ideal state which exists simultaneously somewhere and nowhere. Ultimately, this utopia of female liberty is a fantasy realized only in imagination. However, as the story illustrates, imagination offers the possibility of freedom for everyone. Cavendish has the Empress and her companion, the Duchess, replicate her own authorial example, by turning inward to invent worlds in their imagination. This is one lesson from *Blazing World* which (p. 511) all readers may put into practice for themselves: Cavendish concludes her story by inviting them to do so. This is not the only occasion where Margaret Cavendish reminds her readers that thoughts are free, especially for women. The mind is a space where women (and men, for that matter) may have inward freedom, beyond the control of politics and society. Freedom of thought is freedom to think and imagine as one pleases, that is, to be in control of one's thoughts and fancies. The mind is, therefore, not just the site of mental equality between the sexes, but also the preserve of individual liberty.

## 21.4 Mary Astell

The political context within which Mary Astell lived and wrote was defined by the so-called Revolution Settlement of 1688, in the aftermath of William of Orange's deposition of James II. Although this spelled greater religious freedom for non-conformists, the Toleration Act of 1689 was a compromise which failed to satisfy all parties. The political philosopher most associated with the Williamite revolution and the drive for religious toleration was John Locke, who published his *Two Treatises of Government* in 1690 with the declared purpose of supporting King William, 'to make good his Title, in the Consent of the People' (TT: Preface, 137).<sup>3</sup> Locke's relevance to the present discussion is that he too argued for human equality on grounds of equality of intellectual powers: according to Locke, all humans are equal by virtue of being corporeal rational agents. Unlike with Poulain, Cavendish, and Hobbes, Locke's position is sanctioned by religious considerations, since, as rational corporeal agents, all humans have a special moral relationship to God (Waldron 2002). This argument was not specifically framed with women in mind, but applies to humans as a species, and therefore, *de facto*, to women. In his discussion of family relations, furthermore, Locke defends the parental rights of mothers as equal to those of fathers. He nevertheless retains customary subordination of wives to husbands, with the result that the contractual conditions of marriage are unequal for women, as compared to their standing as equal political citizens. Where Cavendish sought to mitigate the restrictions on women's freedom and equality arising from the gender norms of her day by judicious application of Hobbesian political ideas, for Locke monarchical absolutism on the *Leviathan* model represented the very type of arbitrary government which reduced subjects to a state of slavery. However, Locke's account of freedom as non-dependence on (p. 512) the power of another (the obverse being the condition of slavery) removes none of the tensions to which Margaret Cavendish called attention in marital relations. On the contrary, although for Locke women are theoretically free and equal citizens, they are still *de facto* subordinate to men, and within marriage they become *de jure* subordinate. On Locke's own definition, this dependence of wives on husbands is tantamount to a condition of slavery. Whether Locke is guilty of unintentional sexism, or sexist bad faith, is the subject of lively debate today (Pateman 1988; Hirschmann and McClure 2007). In the seventeenth century, in spite of his bringing God into his definition of equality, not everyone was comfortable with the libertarian political conclusions which he drew from his arguments for equality. And one such was Mary Astell.

In politics Mary Astell was opposed to the Whig interest represented by Locke. Like Margaret Cavendish, she was a monarchist, but unlike Cavendish, her preference was for constitutional monarchy, that is a monarchy regulated by the rule of law (Astell 1996: 170–1; Astell 1704b). A major difference between Mary Astell and Margaret Cavendish is that Cavendish's political writings are strikingly secular in character, whereas Astell's are overtly religious, and her feminist arguments are rooted in her spiritual values. In philosophy, she was a dualist, indebted to both Cartesianism and Cambridge Platonism, and opposed to Hobbes. As a high Tory in politics and High Church in religious affiliation, she subscribed to the doctrine of passive obedience or non-resistance adopted by monarchists opposed to William III. Nevertheless, she was actively engaged in the party politics of her day, to which she contributed a number of polemical pamphlets and tracts: e.g. *A Fair Way with the Dissenters* and *Moderation Truly Stated*, both published in 1704. These express her hostility to the demands of religious dissenters for greater political and religious freedoms, demands which she regarded as a cover for more sinister political ambitions (she pilloried them as the political progeny of the regicides responsible for the death of Charles I). Contemporary politics aside, she defended the intellectual equality of men with women and argued in favour of women's education. She also put forward arguments for female autonomy to be secured by means of an independent female community where women might retain their single status, without any obligation to marry (*Serious Proposal to the Ladies*). She nevertheless defended the institution of marriage and supported sexual inequality within marriage (*Reflections upon Marriage*).

Astell's understanding of gender equality is complicated by her acceptance of a political and social order which she regarded as divinely instituted by a providential God. As a monarchist, she had every reason to uphold the status quo, and that meant accepting the subordination of women. Yet as a feminist she had every reason to oppose the claims of custom which was responsible for perpetuating the injustice of female subordination. 'The Custom of the World has put Women, generally speaking, into a State of Subjection, is not deny'd' she writes in *Reflections*, 'but the Right can no more be prov'd from the Fact, than the Predominancy (p. 513) of Vice can justifie it' (Astell 1996: 10). As a monarchist, she was committed to the traditional political order, and as a committed Anglican, she was bound to accept the sacraments of the church and to obey church authorities. She also defended marriage on practical, social grounds, arguing that 'The Christian Institution of Marriage' is the best way of securing 'domestick Quiet and Content' and 'the good of society'; she acknowledged, nonetheless, that marriage may have 'inconveniences', but that this is true of all conditions (Astell 1996: 37). She therefore accepted the practical necessity of accepting some kind of authority in both the state and family: 'unless this Supremacy be fix'd somewhere, there will be a perpetual Contention about it, such is the love of Dominion, and let the Reason of things be what it may, those who have least force, or Cunning to supply it, will have the Disadvantage' (Astell 1996: 15).

For Astell the nature of freedom is very much bound up with issues of authority and obedience. It is particularly in her discussion of marriage that the issues of freedom, authority, and obedience arise. And they arise with particular acuteness since, being obliged as a good Anglican to accept marriage as a sacrament, she was bound to accept that the husband had authority over his wife. For that reason she had no sympathy with the Duchess of Mazarin who had left her tyrannical husband and sued for divorce (Hill 1986). (It was reading about this high-profile divorce case which prompted Astell to write her *Reflections upon Marriage* (Astell 1996: 32).) Her condemnation of the Duchess' conduct did not, however, mean that she did not feel sympathy for her, or that she condoned the behaviour of her husband ('Monsieur *Mazarine* is not to be justified, nor Madam his Spouse excus'd', she declared (Astell 1996: 33)). Nevertheless, Astell was under no illusions about the burden of marital disempowerment of women and the exacting nature of wifely subordination within marriage. What is at issue in her discussion of the treatment of women is the proper conduct of those in power. Astell underscores the difference between tyranny and good government in terms of the different kind of obedience they demand. The difference between the slave and the subject is that the obedience of the slave is exacted by force, whereas the obedience of the lawful subject is offered willingly. In the Preface which she added to the 1703 edition of *Some Reflections* she compares the status of women within marriage and status of the subject in tyrannical government. In the 1703 Preface she skilfully invokes the political rhetoric of her Whig enemies, to underscore the deleterious consequences of basing power relations in natural rights. She argues that if we accept the premise that 'Arbitrary Power is evil in itself, and an improper Method of Governing Rational and Free Agents', it follows that 'it ought not to be Practis'd any where', least of all in the private sphere.



Tyrannical rule is 'more mischievous in Families than in Kingdoms', because there are so many more opportunities for it, there being thousands more husbands than there are monarchs. She accuses those who argue for the natural subordination of women of practising double standards by upholding one rule in the sphere of public politics and another in the family. Drawing an analogy (p. 514) between the monarchy and marriage, she highlights the inconsistency of the contractual terms which apply to each:

is it not then partial ... to the last degree, to contend for, and practise that Arbitrary Dominion in their Families, which they abhor and exclaim against in the State. (Astell 1996: 17)

Astell underlines the unjust consequence of assuming the natural superiority of men to women, by pointing out its consequences in terms carrying unmistakable verbal echoes of John Locke's *Two Treatises of Government*.<sup>4</sup>

If *all Men are born free*, how is it that all Women are born slaves? as they must be if the being subjected to the *inconstant, uncertain, unknown, arbitrary Will* of Men, be the *perfect Condition of Slavery*? And if the Essence of Freedom consists, as our Masters say it does, in having a *standing Rule to live by*? And why is Slavery so much condemn'd and strove against in one Case, and so highly applauded and held so necessary and so sacred in another? (Astell 1996: 18–19)

This allusion to Lockean political theory creates a point of convergence between the two aspects of Astell's politics (the feminist and the Tory) allowing her modern readers to read her politics out of her feminism, and to see her feminism as an assault on the marriage contract.<sup>5</sup> While there is no doubt that she understood and ridiculed the assumptions of republican theories of freedom, it is not the case that the treatment of women about which she complains is exclusive to male Whigs and not a failing of male Tories. Consequently it is not clear how her charge of double standards would persuade those who do not subscribe to Lockean rights theory, unless her remarks are read as a challenge to conservatives *not* to adopt the attitudes of their Whig *nemeses*. The latter interpretation would seem to be supported by the ensuing argument in this Preface, in which she invokes biblical authority to demonstrate that female subordination is not part of the order of nature ordained by God. The catalogue of excellent, exemplary, and often powerful women which she compiles from the Bible<sup>6</sup> underscores the fact that it is her theology, not political theory, which holds the key both to her political conservatism and her feminism. When she writes of her intention 'to retrieve, if possible, the Native Liberty, the Rights and Privileges of the Subject' (Astell 1996: 8), she has in mind not the Bill of Rights, but 'this Natural Right of Judging for her self' (Astell 1996: 10). In other words, when she talks of 'liberty', she means not the political liberty of the citizen or subject, but the freedom to exercise our God-given (p. 515) reason, which makes women equal with men. This is a view that takes as given that men and women are equal in mind and soul (Astell 1694: 79). It is a view which she derives theologically from the Bible and from her conception of God as wise and benevolent. This enables her to propose a conception of freedom as inner freedom, without compromising her acceptance of the social order:

'tho the Order of the World requires an *Outward* Respect and Obedience from some to others, yet the Mind is free, nothing but Reason can oblige it, 'tis out of the reach of the most absolute Tyrant. (Astell 1996: 56)

In order the better to understand how Astell upholds her views on freedom and equality without compromising her religious and social conservatism it is helpful to read *Reflections upon Marriage* in conjunction with her earlier *Serious Proposal to the Ladies* (1694). In this earlier work, she makes her case for women's education, and for the setting up of a female community of single women organized along lines similar to an Oxford or Cambridge college. Astell conceived of this institution as a retreat from the world, and it is probably for this reason that she compared it to a monastery (a comparison which opened her to the unfounded accusation of Catholic leanings). However, in Astell's mind, such a retreat does not infringe upon personal freedom, partly for the reason that all members of the community participate voluntarily. But also, she argues, women's joining such a community increases their freedom because they are thereby liberated from the rule of custom which dominates the world outside (Astell 1694: 121). The education offered them within the community enhances every individual's personal freedom because it frees her from subjection to her passions and the ignorance and false ideals which cloud the lives and decision-making of most women (Astell 1694: 166). Education cultivates the rational mind, enabling

women to understand the nature of true goodness, and the true, spiritual happiness which is their proper goal. Through education women are better able to make informed choices, and to be confident of their ability to do so (Astell 1694). As far as marriage is concerned, the importance of this is that an educated woman will have a better understanding both of the duties of marriage and qualities which make a good husband (Astell 1996: 74). She will be less likely to allow her passions to rule her choice of husband, or to succumb to the flattery of self-interested men (Astell 1694: 146). When a woman exercises choice on the basis of a reasoned judgement, she acts freely—even though, in agreeing to marry she places herself in subjection to her husband. As Astell puts it, she ‘Elects a Monarch for Life’ (Astell 1996: 48), so underlining both the subordination of the wife to her husband, and the fact that she makes a free choice of husband. A woman who enters into marriage in this way is therefore not a slave, but a willing subject. Of course, Astell is realistic enough to recognize that this does not guarantee matrimonial harmony. But there are three further ways in which education serves to strengthen the institution of marriage. First of all, education (p. 516) raises woman’s dignity and, thereby, men’s esteem for her. An educated woman is less likely to be treated with contempt by her husband. Secondly, an educated woman brings to marriage the capacity to direct the moral education of her children, both male and female, so laying the foundations for improved gender relations in future generations (Astell 1694: 155–6). The third value of education for the married woman is its consolatory value, if she is unfortunate enough to marry a tyrannical husband, or if marital relations break down. Even in such circumstances, like the ancient Stoics (like Cato, to whom Astell makes reference (Astell 1996: 63)), she retains her inner freedom ‘the Mind is free ... ’tis out of the Reach of the most absolute Tyrant’ (Astell 1996: 56). This stoical response to marital adversity amounts to a policy of passive obedience like that adopted by Tory opponents of the Revolution Settlement of 1688.

That said, Astell’s argument for women’s education contains an important ‘opt-out’ proviso which was not available to William III’s reluctant Tory subjects. And that is that she upholds a woman’s right to refuse marriage. Just as education can assist a woman in making an informed decision to accept an offer of marriage, it can also lead her to decide that marriage is not for her. Since she will understand the purpose, nature, and conditions of marriage, she will have a better idea of what is being offered than a woman who is in thrall to her passions or false ideals. She may, in consequence, decide that marriage is not for her—marriage is nothing short of Martyrdom, requiring such strength of spirit that not every woman will feel able to undertake it. The significance of Astell’s proposal for a separate female community is, therefore, twofold. It was both a practical proposal to realize her desire for improved women’s education, and it was an instrument, thereby, to enhance the personal freedom of individual women, and to make it possible for a woman to retain her autonomy as a single woman if she chooses not to marry.

Although Astell was a thinker of a rather different stamp from Cavendish, there are parallels in their perception of the problems faced by women and the solutions they offer. Astell was no less realistic about the harsh realities of women’s subordination. Both attempt to negotiate with the social status quo, within the constraints of which they attempt to enlarge women’s scope for free action. Both women focus on the responsibility of men to alleviate women’s condition by arguing that it is, in the end, in the husband’s self-interest to conduct himself benevolently so as to inspire the lasting loyalty of his wife. And both identify a domain of personal, inner freedom which is linked to their arguments for the education of women. For both women, therefore, to educate women was not merely a matter of improving the quality of women’s lives, but integrally connected to their conceptions of liberty and equality. This is a theme which carries over into the arguments of eighteenth-century feminists, forming a point of continuity with Catharine Macaulay and Mary Wollstonecraft (Hutton 2005; Broad and Green 2008).

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## Notes:

(1) For a selection see Smith, Suzuki, and Wiseman 2007.

(2) For a full discussion of the relationship between freedom and determinism in Cavendish's natural philosophy see the excellent article by Detlefsen (2005).

(3) As is now well known, *Two Treatises* was written many years before this. The work was published anonymously, Locke's authorship only being admitted posthumously.

(4) This is one of very few allusions to Locke in Astell's writings.

(5) See especially Springborg's Introduction to Astell 1996 and Springborg 2005. Springborg's argument is indebted to Carole Pateman's analysis of contractarianism (Pateman 1988). For reservations and corrections of Springborg's claims regarding Astell and Locke, see Goldie 2007 and Broad and Green 2008.

(6) Cf. Lady Mary Chudleigh (1700) whose argument against male right of dominion over women challenges the biblical interpretations on which clergymen draw to defend it.

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## Thomas Hobbes' *Leviathan*

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### Abstract and Keywords

This chapter examines Thomas Hobbes's book entitled *Leviathan*. It suggests that this work is more than just an account of social contract, and explains that Hobbes also explored the issues concerning the human mind and its affects and powers, the psychology of religion, language and reasoning, and the condition of English higher education. The chapter also considers the place of natural persons in Hobbes's systems and suggests that Hobbes deployed two conflicting images of humanity in his writings.

Keywords: *Leviathan*, social contract, human mind, psychology of religion, higher education, natural persons, humanity, language, reasoning

EXCORIATED in its time by philosophers and clergymen, Hobbes' *Leviathan* has earned a place as one of the most influential pieces of philosophical writing of the seventeenth century, with Hobbes' brief but unforgettable discussion of the exit from the state of nature and the formation of civil society in Chapters 13–14 continuing to serve as a point of departure for modern discussions of contractualism.<sup>1</sup>

*Leviathan* comprises far more however than an account of the institution of the social contract. Composed rapidly in France and printed in London in 1651,<sup>2</sup> the treatise recapitulates and develops the earlier doctrines of the *Elements of Law* (1639) and *De cive* (1642), devoting considerable space to the human mind and its affects and powers, to language and reasoning, the psychology of religion, and the condition of English higher education. The book's curious title—'Leviathan' in the Book of Job is a monstrous sea creature who is described as the 'King of the Proud'—has only recently been elucidated. Noel Malcolm traces a long history of (p. 520) debate over the animal's genus, its associations with Satan, and its relationship with God in Biblical commentary, and he notes its appearance as a symbol of social cohesion and monarchical power in Jacques Boulduc or Bolduc in a work published in Lyon in 1619 and Paris in 1637 (Malcolm 2007: 34).<sup>3</sup>

In Part I, Hobbes expounds a theory of perception, reasoning, and volition in accord with his notorious 'corporealism' and his rejection of separable, incorporeal Cartesian souls. There as well he sets out a frank account of the fundamental hopes, fears, and motivations of human beings, reinterprets the notion of a moral-political law of nature on that basis, and deduces the need for an absolute Sovereign. In Part II, he discusses the organization and characteristics of a stable, successful commonwealth under an ideal Sovereign. In Parts III and IV of his treatise, Hobbes reinterprets the Christian Bible and its main teachings in line with his materialism. His book concludes with a devastating attack on the Universities, who teach not philosophy, in his view, but 'Aristotelity', and an exposé of 'darknesse in religion' and the priestcraft of Presbyterians and Catholics.

For Hobbes, ‘( ... the *Universe*, that is, to say the whole masse of all things that are) is Corporeall, that is to say, Body; and hath the dimensions of Magnitude, namely, Length, Breadth, and Depth: also every part of Body, is likewise Body, and hath the like dimensions; and consequently every part of the Universe, is Body, and that which is not Body, is no part of the Universe’ (*Lev.* 463). Spirits are bodies too, and God is body. In calling God ‘Incorporeall’ we express our desire to honour Him, not our comprehension of His nature’ (*Lev.* 464). The doctrines of essences, forms, and other incorporeal principles are not only ontologically false but also socially and politically pernicious. The ideology of incorporeal spirits promotes fear of ghosts and demons and submission to priests. Submission to priests and a belief in transcendental authorities and powers makes men unruly and unwilling to submit to legitimate temporal rulers.

Hobbes invited his contemporaries to understand their place in the natural world as strictly mortal entities, fundamentally equal in natural merit and natural authority, and he urged them to apply their efforts to eliminating the residual violence and molestation that indicated that the state of nature had not been fully superseded by civilization. His dark view of individual humans and his authoritarian conception of government are standard items for commentary; his positive vision of a mannerly, egalitarian, and industrious society is typically obscured.<sup>4</sup> Yet (p. 521) interpreters who view Hobbes as attempting to write morality out of politics, replacing it with prudence and self-interest, do him considerable injustice, as to a lesser extent do those who regard him as reversing the progressive Grotian tradition of natural law. Hobbes’ particular combination of naturalism and normativity, of pessimism and hopefulness, makes his philosophy notoriously difficult to interpret systematically. His appeals to the Laws of Nature are not easily reconciled with his doctrine that all is Body; and neither his materialism, nor his faith in the existence of and our cognitive access to these Laws is easy to reconcile with his demand for full support for a Sovereign with undivided authority. It is difficult to see how binding, albeit generally unrecognized, obligations can gain a foothold in Hobbes’ corporeal universe, and how the existence of these Laws, ‘the Fountain and Originall of Justice’, can be reconciled with the fact that, outside of political society, in which law is backed by the Sovereign’s punitive force, ‘nothing can be Unjust’.

Text-internal methods of analysis, in short, are unable to reveal the basic coherence of Hobbes’ text, which can be made more visible by considering some of its sources, its relation to earlier texts, and Hobbes’ overall aims and intentions. While the book is addressed to contemporary readers, it also embodies a virtual argument with the classical political theorists, Aristotle and Cicero. The depiction of human beings as anti-social, and as naturally resistant to, rather than accepting of domination is employed to clear the ground of ideological theories of power, which, in Hobbes’ own time permitted really arbitrary despots to rule—despots who considered themselves as like gods—rather than the highly constrained despot he envisioned.

Hobbes favoured the Epicurean interpretation of nature—the basis of his own mechanical philosophy and his account of qualities—and Epicurean contract theory over the Stoic account of civil society. At the same time, the connection between the natural and the normative is mediated in his philosophy by his adherence to the position that the ultimate good for human beings is not salvation or union with God, but what the Stoics termed life in accordance with nature. While Hobbes rejected their theses of natural sociability and benevolence, as well as Greek intellectualism, about which he could be scathing, he endorsed, and held for realizable, their ideal of harmonious coexistence under a condition of disciplined passions, life ‘developed to its full perfection and supplied with all its needs’ (Cicero 1931: 421), implying the application of human capabilities to art, industry, and the search for knowledge. Hobbes’ own Laws of Nature conform to the Ciceronian definition of natural law as ‘the highest reason, implanted in Nature, which commands what ought to be done and forbids the opposite’ (Cicero 1928: 317).<sup>5</sup>

## (p. 522) 22.1 Natural Persons in Hobbes’ System

Hobbes begins not by stating the specifics of his ontology directly, but with an exploration of the source of human ideas. This choice of a starting point enables him to present his view of human beings as enmeshed in physical nature and their experiences as deriving directly from nature. As well, it prepares the ground for his exploration of the referentiality of ideas

with the aim of distinguishing truth from error, superstition, and prejudice.

Perception is the result of the pressure of material things on the nerves, strings, and membranes of the body communicated within to the brain and heart, whose resistance, or counter-pressure towards the external world creates the appearance of externality in our experiences (*Lev.* 13). Colours and sounds, Hobbes maintains, following the line of argument laid down earlier by Galileo, Gassendi, and Descartes, are not in bodies, but are only appearances (*Lev.* 14); this is shown by the fact that colours can be separated from objects by glasses and sounds from their sources in the case of echoes. Dreams and ‘strong Fancies’ are to be distinguished from ‘Vision and Sense;’ the motions rousing the former begin within the body rather than outside it. This distinction is meant to tell against the numerous seventeenth-century visionaries who considered dreams as important communications from the dead, from good and evil angels, or from God himself. Hobbes goes on to warn against the employment of names that are but ‘insignificant sounds;’ these include many philosophical terms such as ‘incorporeall substance’. Those who derive all their learning from books are snared by absurd definitions and are described as fluttering over their texts ‘as birds entering by the chimney, and finding themselves inclosed in a chamber, flutter at the false light of a glasse window’ (*Lev.* 28). He emphasizes the practical, applied nature of knowledge, or ‘Science’, characterizing it as the ‘knowledge of Consequences, and dependance of one fact upon another: by which, out of that we can presently do, we know how to do something else when we will, or the like, another time’ (*Lev.* 35).<sup>6</sup> Knowledge is produced by mental operations of composition and decomposition upon ideas produced by the pressure of existing things, and such knowledge is efficacious in enabling us to change the world in accord with our desires. As he says later at the start of *De corpore*, echoing Bacon, ‘The end of Knowledge is Power’ (*DCo* 7). Political science is derived from nature and is tested by its practical application.

Hobbes now moves on to the theory of action and the psychology of human motivation, treating what he calls ‘Endeavour’ as a primary notion. Endeavours are ‘small beginnings of Motion, within the body of Man, before they appear in walking, speaking, striking, and other visible actions’. Endeavour substitutes in (p. 523) Hobbes’ system for the Will, which he does not acknowledge. When it is experienced as tending towards the object that mechanically causes it, Endeavour is termed ‘Appetite’ or ‘Desire’ (*Lev.* 38). Just as there is no faculty of the will, what we term ‘deliberation’, considered a mark of high rationality, is common to humans and beasts and is only a succession of ‘Appetites and Aversions, Hopes, and Feares, concerning one and the same thing’ which terminates when ‘the thing be either done or thought impossible’ (*Lev.* 44). Hobbes now claims that we call Good that which we desire or have appetite for, and Evil, that which repels us, ‘there being nothing simply and absolutely so; nor any common Rule of Good and Evill, to be taken from the nature of the objects themselves’ (*Lev.* 39).<sup>7</sup>

Continual tranquillity is impossible because life is motion; we are never without desire and fear, the condition of bliss is incomprehensible, and the beatifical vision unintelligible (*Lev.* 46). At the same time, human beings long for understanding and control; they want to know the causes of their good and evil fortune and to master their destinies, and this renders them credulous, anxious, curious, and religious. Chapter 12, ‘Of Religion’, is heavy with satire. The ancients, Hobbes tells us, populated the world with fawns, nymphs, and ghosts, worshipped crocodiles, snakes, and leeks, read the entrails of beasts and the lines of the hand to divine the future, and erected temples to fever and rust, as well as to time, night, and day. The ‘Opinion of a Deity, and of Powers invisible, and supernaturall’, Hobbes concludes, ‘can never be ... abolished out of humane nature’ (*Lev.* 83). With this non-idealized sketch of human beings, with all their unachievable aspirations and ineradicable delusions in place, Hobbes goes on to extract his main normative conclusions and to practise his social critique.

## 22.2 Nature, Politics, and Violence

Hobbes intended, he explained, to derive ‘the Rights of Sovereigne Power, and the duty of Subjects hitherto, from the Principles of Nature onely’ (*Lev.* 255). His data were psychological and social, the features of human mentality and appetite just mentioned and the historical reality of periodic wars and civic revolutions. For Hobbes, political upheavals were not explained by supernatural agency or human sinfulness. No demonic interference and no divine plan either lay



behind historical cycles of violence and pacification. War, punctuated by intervals of peace, is the (p. 524) condition into which human society, in the absence of an adequate political philosophy and an effective sovereign, inevitably slips.

The historian Thucydides, whom Hobbes admired and translated, described the oscillating condition of earlier Greek society, and he made his opinion of 'the imbecility of ancient times' clear. Before it was exhausted by the Peloponnesian War and the plague that followed, according to the memorable speech Thucydides put into the mouth of Pericles, Athens had been a cosmopolitan trading centre of law-abiding citizens, with the right proportions of labour, recreation, games, and sacrifices to ensure 'the daily delight whereof we expel sadness' (Thucydides 1989: 110). Thucydides went on to describe movingly and memorably the breakdown of this society, the loss of virtue, and the perversion of the language of morals, as men's passions were inflamed, and as they took up arms and mobilized troops. For Thucydides, 'the nature of man ... is wont even against law to do evil', and the horrors of war 'have been before and shall be ever as long as human nature is the same' (1989: 204–6). The propensity to civil chaos and war was obvious in Hobbes' own time, from the recent terrifying struggles with Spain, the Thirty Years War on the Continent, the execution of King Charles I, the seizure of power by Parliament, the English Civil War, and the savage conflicts in Ireland. The hatred of tyranny was entrenched in the Athenian democracies and oligarchies, and this attitude had led to a depressing series of political assassinations and revolutions, which Hobbes saw as re-enacted in his own time.

From one perspective, Hobbes' offer to derive the theory of political obligation from the principles of nature was no innovation; all classical political theory attempted to base politics on nature. Classical political theory failed, however, to explain why chaos and upheaval were constant threats and how to diminish these threats. The persistence of war, criminality, and regicide furnished, in Hobbes' eyes, decisive proof that neither human sociability nor natural relations of dominance and subordination were appropriate supports for stable political institutions.

Both Aristotle and Cicero posited sociability and a love of civic life as species-specific endowments that made political structure natural for human beings.<sup>8</sup> According to Aristotle, the state is 'a union of people who need each other', and man is by nature a political animal. Society is conceptually prior to the family and the individual; they cannot survive in its absence (AR, 2: 1987). They were further alike in finding in the physical universe models of regulation, dominance, and obedience. The scientific understanding of the natural world, on their view, confirmed the existence of natural hierarchies; higher entities ruled lower ones, and form, the superior principle, mastered matter. According to Aristotle, rulers and subjects exemplify cosmic dualities—versions of the complementarity of form (p. 525) and matter, soul and body, master and slave, and male and female, and relationships based on nature are stable, as those based on force or 'convention' are not.<sup>9</sup> Jean Bodin's theory of sovereignty as 'high, absolute, and perpetual' betrayed its classical origins in taking the commonwealth to be a sort of extended family and the relationship of wife to husband as a model of subordination and sovereignty (Bodin 1606 [1576]: 14ff.). His absolutism was, however, foreign to the spirit of the ancients, for Bodin places the sovereign above the law in most respects and accountable only to God. '[S]overeign majestie, and absolute power', he remarks, consists 'principally in giving laws unto the subjects in generall, without their consent' (Bodin 1606: 98).

The need for a socially insensitive strongman, of the sort earlier described by Niccolò Machiavelli, to control warring aristocratic factions in the emerging European states was thus widely acknowledged. To arrest the natural oscillation between civilization and destruction that had always characterized human societies, Hobbes believed in turn, citizens would have to give up the demand for power-sharing that was a memorable feature of the English political heritage at least since the Magna Carta and drive into quiescence the motivating forces of religious inspiration and conviction. But there was an implicit contradiction between the familial or friendship model of the commonwealth and the doctrine of the absolute sovereign. Hobbes cut through the confusion by accepting the authoritarian premise, but depriving it of any natural foundation; it is for this reason that he emphasizes so strenuously the unsociability of human beings in the state of nature. There is no natural subordination of female to male, and slavery, while justifiable, is not natural either. Aristotle, Hobbes' observed, 'maketh men by Nature, some more worthy to Command, meaning the wiser sort (such as he thought himselfe to be for his Philosophy;); others to Serve, (meaning those that had strong Bodies, but were not Philosophers, as he;) as if Master and Servant were not introduced by the consent of men, but by difference of Wit: which is not only against reason,

but also against experience' (*Lev.* 107).

The theory of natural subordination, applicable to both political subjection and to outright slavery, had not gone unchallenged even in the imperialistic slave societies of late antiquity. Stoic thought posited the natural equality of all men, and the later natural law tradition held that there were no slaves by nature, although slavery was often just. Writing just before Hobbes, Hugo Grotius insisted firmly on this point, referencing the Roman and canon jurists.<sup>10</sup> For Hobbes, all subjection was effectively 'by convention' and derived from an agreement to (p. 526) relinquish the natural power to aggress, accumulate, and retaliate. Because subordination cannot be natural and sovereignty cannot be divinely infused into a human being, all power that is not based in illusion and mystification, and accordingly fragile—since no human being is really stronger than his fellows, or capable of monopolizing power indefinitely, as the history of assassination and usurpation shows—must be awarded by the governed. People need good reasons to relinquish power to an absolute sovereign, but the sovereign also needs a monopoly on power to coerce the recalcitrant, the ignorant, the forgetful, and the irrational.

In alluding to a putative prehistoric formation of the social contract in Chapter 13, Hobbes again signalled rather aggressively his affinity with the ancient materialists for whom the cosmos and, within it, all forms of life and all social structures, had emerged over time from the concourse of atoms, without assistance from the gods or the pre-existence of a divine plan. Hobbes' references to the narrative of the evolution of primitive humanity from solitary subsistence to contract and political society were recognized by his Latin-educated readers. Lucretius had described early humans as tough, shaggy creatures living 'random-roving lives like wild beasts' (2001: 162) who came together into tribes with the accidental discovery of fire (and so weaponry), and Ovid described the next stage of human existence *ante legem* as a period of brutality—a true war of all against all—in his *Metamorphoses*.<sup>11</sup> Thomas Creech, in the preface to his 1686 translation of Lucretius' *De rerum natura* noted that 'the admirers of Mr Hobbes may easily discern that his Politics are but Lucretius enlarged; His State of Nature is sung by our Poet: the rise of Laws; the beginning of Societies; the Criteria of Just and Unjust exactly the same, and Natural Consequents of the Epicurean origin of Man; no new adventure' (quoted in Mayo 1934: 64).

According to Epicurus, on whom Lucretius based his own account, justice is 'a symbol or expression of expediency, to prevent one man from harming or being harmed by another'. Further, 'animals which are incapable of making covenants with one another, to the end that they may neither inflict nor suffer harm, are without either justice or injustice', and tribes that fail to formulate such covenants are in the same condition as animals (Diogenes Laertius 1925, 2: 675). The discovery of 'savage people in many places of *America*' grouped into small warring tribes seemed to Hobbes evidence that, even if there had been some exceptions, the poets were generally correct in their depiction of early man (*Lev.* 89). Humans in the state of nature do not need each other, not even to raise children, and they are not social (p. 527) animals, like ants or bees, which do not steal from one another, compete with one another, or challenge the authority and entitlements of their rulers. Our intrinsic unsociability is evident from the fact that we lock our doors, and chests, mistrusting our own children and servants as well as our fellow citizens, and from the observation that everyone arms himself for a journey and takes a companion along if possible.

Hobbes' focus is not on the problem—albeit an interesting one—that preoccupies many modern commentators: how a population of self-replicators might evolve from one composed of rational egoists to one composed of rational, altruistic cooperators. He says simply that the social contract is formed when fear, desire, and hope motivate human beings to renounce their natural right to anything and everything (*Lev.* 90). Once formed, it would seem to need these emotions to keep it going only when the transference of supreme power from ruler to ruler failed for some reason. But either these contract-engendering attributes are already present in the state of nature but strangely inoperative; or they are suddenly and inexplicably acquired. Hobbes does not unravel this riddle. He even concedes that the state of nature, with its 'warre, as is of every man, against every man', in which life is 'solitary, poore, nasty, brutish, and short' (*Lev.* 88–9) may not have existed everywhere in the world. He seems to take it for granted that human beings, under the influence of chance and necessity, groped and stumbled their way to the formation of non-aggression pacts. His real concern is with the problem of ambient hostility and recurrent rebellion in societies that have already exited from the state of nature. His conceptual starting point is the condition intermediate between mere subsistence and true civilization and tending to oscillate between those two poles.

This intermediate condition isn't an all out war of all against all, but it is a condition in which anyone can be at war with anyone else and in which someone usually is at war with someone. It is both normal and lamentable; and, as Hobbes sees it, no matter how exhausted men are by 'irregular justling and hewing one another', they cannot, 'without the help of a very able Architect, be compiled, into any other than a crasie building' (*Lev.* 221). The philosopher, as able architect, has to show them how and what to build.

Hobbes' presentation of the Laws of Nature is the central plank of his remodelling programme for civic actors, and his perception of the need for a despotic Sovereign followed from his conviction, on one hand, that obedience to the Laws was necessary and sufficient for the construction of a good and stable society, and his perception, on the other hand, that even if the Laws could be conceptualized (as Hobbes suggested they could be) as divine commands, there never was a God available to enforce them, and civil society should not—and manifestly could not—depend on the myths of retribution and reward. The Laws of Nature have to be enforced, and infractions punished, in the here and now.

## (p. 528) 22.3 The Laws of Nature

In chapters 14–15 of his *Leviathan*, Hobbes specifies his Laws of Nature. These are assuredly not the natural laws of Pauline Christianity, Roman jurisprudence, or St Thomas Aquinas. But are they at bottom prudential maxims for furthering self-interest, or are they Kantian imperatives? Were they obligatory but unenforceable in the state of nature or did civil society create moral obligation? As he is normally taken to be a critic of the natural law tradition, it is useful to consider Hobbes' relationship to his immediate predecessor, Hugo Grotius.

In the Prolegomena to his treatise on just conduct, *The Rights of War and Peace*, Grotius had explained his project as a refutation of the second-century BCE sceptic Carneades, who maintained that justice varied with time and place, that it was defined by the powerful for their utility, and that it was irrational to be just when it conflicted with self-interest. Grotius' own philosophical loyalties were to the Stoic doctrine of natural sociability, and an eternal code of right and wrong, which, he argued, even in the absence of a God, would mandate certain rules of justice.

Among the things which are unique to man is the desire for society, that is, for community with those who belong to his species ... but one at peace, and with a rational order. Therefore, when it is said that nature drives each animal to seek its own interests, we can say that this is true of the other animals, and of man before he came to the use of that which is special to man ... This care for society in accordance with the human intellect ... is the source of (justice) properly so called, to which belong abstaining from another's possessions, restoring anything which belongs to another ... being obliged to keep promises, giving compensation for culpable damage, and incurring human punishment ... What I have said would be relevant even if we were to suppose (what we cannot suppose without the greatest wickedness) that there is no God, or that human affairs are of no concern to him. (Grotius 2005 [1625] 3: 1747–8)

Grotius insisted further that:

The principles of natural law are clear and self-evident, to a much higher degree than the things which we perceive with our outward senses—even though our senses do not fail us if their organs are working properly and other necessary conditions are met ... [W]hat is affirmed by many people at different times and places to be obvious must be presumed to rest on some universal reason. (Grotius 2005 [1625] 3: 1756)

Grotius' account is as puzzling as Hobbes' is alleged to be. If the laws of nature are self-evident, why did the ancient and medieval authorities have to articulate them, and why have they been ignored and contravened to the extent that it is necessary for Grotius to remind his readers of them at such length?

By way of clearing the ground, Hobbes takes issue with Grotius' claim that the laws of nature are self-evident, and he

rejects Grotius' methodology of argument by the citation of religious and legal authorities. Hobbes' laws of nature are not (p. 529) descriptions of behaviour that is typical of the species, often observed in other living creatures, that corresponds to an innate disposition, or that can be violated in the case of the *crimen contra natura*—'nature' meaning, for example, heterosexuality, caring for one's children, obeying authority. Nor are they moral notions imprinted on the heart of man, universally agreed upon, or observed by men in all nations. Rather, the laws are of nature in the sense of being laws for natural men without supernatural connections, endowed with their actual constitutions, abilities, passions, and reactions, but also their cooperative potential. Their authority derives from the fact that they are recognizably functional in light of what people really want—to enjoy the benefits of civilization—and how they tend to behave and to react to one another's behaviour. Even those who are unaware of their normativity want something that only obedience to the Laws can give them, for the condition of men *ante legem* is one of unremitting want and suffering. '[A]ll men', Hobbes insisted in *De cive*, 'as soon as they arrive to understanding of this hateful condition, do desire, even nature itself compelling them, to be freed from this misery' (EW 2: xvii). As miserable as they are, the actors who have stumbled out of the original solitary condition and found their way into rough social relations with one another are still collectively at something of a loss when it comes to preserving their lives and advancing their vital interests, for they do not understand what actions of theirs cause offense and unleash retributive impulses.

Hobbes' starting point is the Stoic premise that every creature seeks to live and preserve its being.<sup>12</sup> To sacrifice one's life or one's vital interests is, according to Stoic moralists, to be mad, irrational, or ignorant. His first Law of Nature forbids anyone to act destructively with respect to his own life; in a sense, as Spinoza scathingly remarked, such laws of nature only forbid what no one wants to do, though this is not true of all Hobbes' imperatives. In bringing this old notion to the fore, Hobbes was not glorifying egoism or propounding the view that egoism could not be restrained except by terror and the sword, but, in effect, instructing his readers to take *other* selves into consideration. The second Law of Nature specifies a precondition for effective preservation. Each is required to lay down the right to all things against all others, provided others will do the same; for some will be vulnerable unless it is agreed that none retain that right.

Ethics was, for Hobbes, a branch of 'manners', based in his understanding of the causes of irritation, resentment, and revenge. His Laws span the political and the social realm, some addressing the issue of comportment due to other citizens and others the comportment due to acquaintances and friends. (Etiquette, he termed 'small manners'.) Some of Hobbes' Laws of Nature correspond to the traditional virtues: justice, equity, modesty, and mercy. They are contrary to the 'natural (p. 530) Passions ... that carry us to Partiality, Pride, Revenge, and the like' (*Lev.* 117). They are rules that smooth social interaction and prevent quarrels or repair offenses. Civilized agents perform their covenants, express gratitude for favours bestowed on them, are complaisant and agreeable to others, pardon the offenses of the repentant, do not punish for revenge but only for future benefit, and they avoid insult or contumely. Other laws concern equity, the obligation to judge disputes impartially and distribute goods equally, that is to say, according to the objective entitlements of the claimants, and genuine equality.<sup>13</sup> The testimony of all witnesses should be taken to count equally. When a resource cannot be divided equally, or according to objective entitlement, or shared in common, it is to be divided, Hobbes says, by lot, or else assigned by primogeniture, that is to say by the luck of the draw in birth order. His remarkable commitment to egalitarianism flows from Hobbes' conviction that intrinsic differences in the quality of men are small and unimportant. Their actions impress others variably, but merit, honour, and worth are, as Hume will later say, painted or projected on them.

A Law of Nature, for Hobbes, can be defined as follows: It is either an affirmation of the basic and equal right of everyone to exist, or a policy which, if consistently pursued by all, enables each not merely to survive but to satisfy his or her real interests as far as possible, and into the indefinite future. The Laws are the ground rules of a well-ordered and productive society that is remarkably egalitarian in its distribution rules, impartial and corruption-free in its dispensation of justice, and kind and mannerly with respect to personal relations. The Laws of Nature, when observed as duties and backed by sovereign power, do not merely cut the costs of human interaction. The society they generate and maintain is one in which men are not consumed by a restless striving after power, but in which natural, though latent, human capabilities, as Hobbes understands them, are expressed. Universal obedience to the Laws of Nature is necessary and sufficient for the realization of the best society that humans, given their drives and desires but also their capabilities and interests, are capable of

constructing.

Hobbes is indifferent to or critical of the classical notion of a *summum bonum*, fitting to the special nature of men (*Lev.* 70). The concept is vague, the condition posited psychologically unattainable, and the ideal has proved useless for politics.<sup>14</sup> His eudaemonism differs from Bodin's in this respect, for Bodin clearly states that, in a well-ordered commonwealth, 'the chiefe end and felicitie ... consisteth in the contemplative vertues' (1606: 7). Yet Hobbes gestures towards human aspirations that he evidently holds to be worthy and universally normative, as well as towards (p. 531) the fear of death that is universal and the opposite of contemptible. The aim of philosophy, he announces in *De Corpore*, echoing Francis Bacon, is 'that we may make use to our benefit of effects formerly seen; or that, by application of bodies to one another, we may produce the like effects of those we conceive in our mind, as far forth as matter, strength, and industry, will permit, for the commodity of human life' (*DCo* 7). Not only does Hobbes reject the Christian notion that mundane achievements are of no value compared with the ultimate goal of salvation, he departs from the ancient philosopher's typical veneration for intellectual achievement and understanding, for the human ability to comprehend incorporeals and logical relations. The atomic machines that constitute us cannot have an essence, but if the philosopher were to ascribe them an essence, it would be as builders. Hobbes is not only an ontological materialist but a social materialist. Material productivity is natural to man, and it is natural to all men, not reserved, as knowledge is, for an elite. The condition humans can achieve *post legem* is, by implication, one characterized by:

Culture of the Earth; ... Navigation, ... use of the commodities that may be imported by Sea; ... commodious Building; ... Instruments of moving, and removing such things as require much force; ... Knowledge of the face of the Earth; ... account of Time; ... Arts; ... Letters; ... Society. (*Lev.* 89)

As much for Hobbes as for the ancients, political community enables men to realize their ideals. It originates, as Aristotle said, to produce the bare needs of life but continues 'for the sake of a good life'. His ideal community is not, however, a stratified society in which intellectuals concern themselves with God and metaphysics. It reflects his modern interest in the fusion of knowledge and power, and in the engagement of the educated classes with the material world.

Most of the Laws of Nature are, however, either framed as conditionals or command only hypothetically, not categorically. Obligation is nullified in cases in which one has good reason to believe that obedience will lead to one's being victimized by others who have not fully capitulated and renounced or transferred their state of nature rights: 'For he that should be modest, and tractable, and performe all he promises, in such time, and place, where no man els should do so, should but make himselfe a prey to others, and procure his own certaine ruine' (*Lev.* 110). This feature distinguishes a Hobbesian Law of Nature from a Kantian categorical imperative, which notoriously commands the agent to perform morally regardless of the behaviour of others and even if it leads to his ruin. But a Law of Nature is not a mere hypothetical imperative or a counsel of prudence, for its aim is not egoistical advancement, that is, advancement that is potentially at the expense of others. Each other-regarding Law, then, can be decomposed into a general normative proposition and a conditionalized, contextualized action-governing proposition, whose logical forms are as follows:

(p. 532) (1) Human needs and interests are such that everyone ought always to do P.

(2) I ought to do P now if and only if everyone else is generally doing P.

Hobbes declares firmly that, in the state of nature, 'The notions of Right and Wrong, Justice and Injustice have no place', and that good, evil, and justice depend on laws that do not exist in the absence of a 'common Power' (*Lev.* 90). Yet elsewhere he suggests that Justice involves thoughtful, careful conformity to Reason (*Lev.* 104), indicating a somewhat more robust notion of the human sense of moral rightness. When, following Epicurus, he asserts that just and unjust do not exist in the state of nature, he does not mean that all behaviour in the state of nature is morally indifferent. The philosopher observing human beings in a full or partial state of nature, through the lens of poetry and mythology, or in historical and actual conditions of war, will be and ought to be morally appalled by the spectacle of egoistic rampaging, treachery, partisanship, and seizure of goods it presents. It is this morally dispiriting spectacle—partly experienced, partly known from



ancient and modern literature, and partly imagined—that occasioned Hobbes’ writing of his political treatises. By his provocative remark, Hobbes meant that ‘just’ and ‘unjust’ are not actors’ categories in the state of nature, a fact that causes natural lives to be sadly impoverished, and that these terms can have no fixed designation in the partially civilized conditions of warfare and rebellion. For, in the absence of formal codes of justice and sanctions to back them up, no one can effectively protest against the injustice he or she suffers, or seek redress for it. Terror and the sword accordingly do not make the Laws of Nature valid; rather, the Sovereign’s punitive power creates just and unjust in civil law by legally defining conditions that constitute contraventions of the Laws of Nature and by either preventing abuse or by providing retribution and restitution through a formal judicial system.

## 22.4 The Expanded and Contracted Role of the Sovereign

The Sovereign’s role is not merely to repress human aggression so that people can avoid being plundered and murdered by their neighbours, but to bring about a society suited to the realization of human capabilities. Sovereign power is the necessary and sufficient condition of a truly agreeable existence by which we are permitted to live ‘securely, happily, elegantly’ (*De homine* 1658, Hobbes 1991: 40). If Hobbes says nothing about the qualities and qualifications of the Sovereign, this is not only because he conceives this artificial person solely as a repository of force—such wisdom as the Sovereign possesses is derived from wise counsellors—but because, (p. 533) in view of the Laws of Nature, he does not need to say much. As Hunter remarks, according to the succeeding tradition of Pufendorf and Christian Thomasius, law is restricted ‘to the commands of a sovereign charged with maintaining social peace, decorum to the cultivation of the external manners required by social intercourse, and morality to the restraint of the passions required by inner serenity’ (2001: 68).

The Sovereign’s artificiality, its lack of personal charisma, and absence of divine backing, does not make it less worthy of submission. Accordingly, no political emotions—not reverence, love, admiration, or esteem—had, in Hobbes’ view, to be directed towards the Sovereign and its deputies, only fear. Yet its role is entirely benign; it protects the corporeal integrity of subjects, reducing the many extant threats to their health and well-being, ameliorating their fear and psychological suffering, and giving institutional and legal support to cooperative undertakings. As Hobbes explains in *De Corpore politico* (1650), the Sovereign enacts and enforces regulations making possible well-ordered trade, the availability of workers, and safe and swift travel, and it places restrictions on luxurious consumption, as well as enforcing ‘peace amongst ourselves’ and defence against foreign power (Hobbes 1999: 173–4). The civil laws supporting these institutions are arbitrary, not in the sense that the Sovereign can decide whatever it likes, but in the sense that they flow only from the objective goodness of the preservation of life and activity, and the Sovereign’s responsibility for furthering them, not from other aims the Sovereign might have and that Sovereigns have historically had. Above all, the Hobbesian Sovereign is not entitled to employ its tremendous powers for the sake of glory, splendour, or imperium. The Aristotelian assumption that ‘political and military actions are distinguished by nobility and greatness’ (AR, 2: 1861) has no place in Hobbes’ system.

Does Hobbes’ logic provide an implicit argument for the existence of a world state, with a world Sovereign? For Hobbes, nationalist sentiment and the state of preparedness for war is an existing and actual form of the state of nature. Kings and princes behave everywhere as bellicose individualists (*Lev.* 90), and peace treaties between them are as vulnerable to opportunism and unilateral defection as agreements between individuals in the absence of power wielded by a third party.

Though there had never been any time, wherein particular men were in a condition of warre one against another; yet in all times, Kings, and Persons of Sovereigne authority, because of their Independency, are in continuall jealousies, and in the state and posture of Gladiators; having their weapons pointing, and their eyes fixed on one another ... But because they uphold thereby, the Industry of their Subjects; there does not follow from it, that misery, which accompanies the Liberty of particular men. (*Lev.* 90)

National wars are compatible with manufacture and commerce, and the hopes and fears of humans accordingly do not motivate them to seek an exit from this condition. But the war of all against all was evidently compatible with subsistence in

the state of nature as well. The passage can be read as suggesting that the (p. 534) quasi-natural condition is fully consistent with, and perhaps even conducive to the flourishing of subjects within belligerent nations (Evrigenis 2007: 126–30); Hobbes is in this case the ancestor of the modern deterrence theorist. It can also be read, however, as lamenting that the reported condition is not perceived as dangerous and that the benefits of full international cooperation are not realized. The existence of a multitude of autonomous, belligerent nation states that both provoke and react to insult and injury as they see fit, rather than in accord with the provisions of a higher authority, is at odds with his conception of the Laws of Nature, in which case Hobbes appears as an early cosmopolitan or world federalist.

## 22.5 Some Persistent Misunderstandings

Hobbes' writings enjoyed a delayed, displaced, and significant influence on the evolution of both British moral philosophy and continental political philosophy. The critique of kingship and kingly privilege as mystification associated with Hobbes and Pufendorf was powerfully developed by the *philosophes* of the eighteenth century. The notion that the benevolence or paternalistic concern of the ruler could be depended upon, or at least ought to be depended upon, to secure the happiness of his subjects ceded to the modern view that the sovereign is a mere role filler with the duty of protecting and securing the welfare of his subjects. This assumption is present even in contemporary democracies that retain the mythology and symbolism of rule by the grace of God.<sup>15</sup> Yet the reaction amongst his immediate English successors was overwhelmingly hostile.<sup>16</sup> Hobbes failed to gain admission to the Royal Society and found himself in conflict with a number of its respected members, including the mathematicians Seth Ward and John Wallis and the chemist Robert Boyle (Shapin and Schaffer 1985; Skinner 2002: 324–45; Malcolm 2002: 317–35). With the exception of Thomas Tenison, critics expended little effort trying to come to terms with the main features of his account. Late seventeenth-century English moralists turned to a defence of natural authority, divine command, eternal and immutable standards of right and wrong, free will, human benevolence and sociability, and innate moral notions. Even David Hume almost a century later offhandedly dismissed the theory of the social contract as the ground of obedience, deeming it inconsistent with understanding and common sense (Hume 1987 [1742]: 42 ff.).

(p. 535) Tenison objected to Hobbes' appeal to the state of nature. While speculative astronomical hypotheses concerning the stars were matters of indifference, he maintained, in so far as nothing in human life depended on their truth, 'fancied Schemes and Models of Polity' threatened 'the Temporal and Eternal safety of Mankind'. Hypotheses, he warned, 'framed by imagination, and not by reason assisted with Memory, touching the passed state of the World, [are] as exceedingly dangerous as they are absurd' (Tenison 1670: 131). We are born and grow up as a matter of fact under paternal authority, he declared, and Cicero was right to call wedlock the beginning of the city. Records of ancient times suggest that even nomadic people observed familiar moral codes, and even if 'every Man (were) supposed loose, even from the yoke of Paternal Government, yet in such a state, there would be place, for the Natural Laws of good and evil' (Tenison 1670: 136). Ralph Cudworth, attacking 'atheistic Corporealism', insisted that '[T]he *Laws and Commands of Civil Sovereignty*, do not make *Obligation*, but presuppose it, as a thing in Order of Nature *Before* them' (TIS: 697). Henry More said that Hobbes' views were 'the Foundation of all Sin and Error'. The notion that good and evil are relative to persons was 'a deep Stream of that Fountain of all *Uncleanness*' (More 1694: 79, 80). More vouched for a concept of the '*Moral Perfection* of human nature *antecedent* to all Society' (More 1685 in Norris 1688: 173). Richard Cumberland, though he rejected Platonism, returned to the Ciceronian position that benevolence was the foundation of political society and re-characterized the Laws of Nature as immutably true and intrinsically obligating (TLN).

Why did so many of Hobbes' critics focus on issues peripheral to the central issue he raised, the locus and justification of authority in a civil society composed of equals? Why did they fail to detect, or at least to comment on the presence of a clearly delineated vision of human welfare and the norms objectively conducive to it? Their neglect is perhaps explained by the fiercer and more dismal portrait of human nature in the opening pages of Hobbes' earlier *De cive*. But it is also explained by the Epicurean ontology in which Hobbes embedded his main propositions and his rabid anti-theology. In the final



two chapters of *Leviathan*, Hobbes ridiculed the belief in incorporeal substances and separated essences, playing to anti-Catholic sentiment, but sparing no clerics of any persuasion. The close ties between the Church and the Universities, evident in the teaching of Aristotelian metaphysics, ethics, and politics, serve to ‘make men mistake the *Ignis fatuus* of Vain Philosophy, for the Light of the Gospel’ (*Lev.* 477). He compared the clergy to ‘Fairies’ inhabiting a fictional world, denouncing them at the same time for befooling the populace by propounding ‘Doctrines, contrary to the Peaceable Societies of Mankind’. Priests, monks, and friars were exempt from civil laws, enriched themselves, and employed Daemonology and Exorcism to try to ‘keep ... the People more in awe of their Power’ (*Lev.* 477). His views about the corporeal God and his bizarre theory of the Resurrection were outrageous by contemporary standards, and, while ostensibly presenting a design for a Christian (p. 536) commonwealth, Hobbes effectively demanded that his readers abandon faith in a future Kingdom of God and in the moral authority of God and his representatives on earth. Further, Hobbes’ Royalist contemporaries had to be won over to his impersonal functionalism, while antimonarchical sectaries had to abandon their view that God and conscience were greater authorities than the Sovereign.<sup>17</sup>

To oppose Hobbes effectively, it was insufficient to argue that men are naturally sociable and benevolent, and that the state of nature was a fiction. For Hobbes could well have conceded a disposition to sociability, active now and then, without it affecting his overall argument. His main point was that human beings are often violent, acquisitive, unkind, and impolite, and are often to be observed in disputes, quarrels, and wars. Nor was it especially relevant to insist on the existence of ultimate standards of good and evil, for Hobbes’ account of the Laws of Nature conceded all that should have been conceded with respect to the objectivity of moral obligation. The issue that should have been raised was their enforcement; for ultimate standards, when posited as independent of men’s basic motivational structures, are obviously not self-enforcing.

Hobbes’ logic had led him to the following political principle:

(1) For any two potentially conflicting parties, an authority with punitive power to end their quarrels and enforce the peace is required.

From this premise, he had gone on to derive, erroneously, the conclusion that:

(2) A supreme authority who can resolve any social quarrel and enforce the peace but who cannot be engaged in any quarrel is required.

If principle (1) seems uncontroversial, principle (2) is not, and Hobbes’ critics would have done better to focus their attention there. Locke, to be sure, came close in observing that if Hobbes is right, ‘Men are so foolish that they take care to avoid what Mischiefs may be done them by *Pole-Cats*, or *Foxes*, but are content, nay think it Safety, to be devoured by *Lions*’ (TT II. 93). Hobbes’ refusal to face up to the dangers of tyranny is especially problematic because the supreme authority, however constrained in principle, is still, according to Hobbes’ theory of the Self, an emotional, power-hungry corporeal machine. What, in the absence of a greater punitive power, could ensure that the Sovereign both enforces the Laws of Nature and does not exercise powers beyond its mandate, which its status must surely tempt it to do? Hobbes was well aware of the historical wickedness of rulers, but the cognitive dissonance it created led him to trivialize it, arguing, in a manner that is at odds with his knowledge of history, that the well-being of the ruler depended on the peace and prosperity of the kingdom, eliminating his motivation to exploit it (p. 537) for his personal advantage, and reminding readers repeatedly of the misery of the state of nature (*Lev.* 128).

The flaw in Hobbes’ reasoning reflects the persistence of hierarchical assumptions. He could in principle have accepted a system of distributed authority that would have been consistent with his analysis of the problem of violence and political ambition. For any dangerous dispute, some person or body with the power to resolve it is required; for any take-over attempt, some police force that can repress it; for any instance of politically arbitrary behaviour or failure to perform in the appointed role, somebody to call the ruler to heel or prod it into action. These authorities need not be more powerful in every respect than the entity whose behaviour they are empowered to judge and to curb or correct. Such conventional institutions as impeachment or recall may be misused or exploited, but the transfer of power they permit is not one of *coup d’etat*, the

ascension of the jealous and well armed, that Hobbes was rightly concerned to eliminate from political experience.

## 22.6 Hobbes and Spinoza

The parallels in the psychological and political doctrines of Hobbes and Spinoza have often been remarked on. Spinoza read Hobbes, and Hobbes in turn admired Spinoza's *Tractatus Theologico-Politicus*.<sup>18</sup> There is no transcendental legislator in Spinoza's system any more than there is in Hobbes', and both are determinists who deny any providential ordering to the universe. Yet neither envisions a purely secular state. Hobbes ridicules religious ceremony and superstition, and puts the Sovereign—whether Christian or not—in charge of religion, but he supports his views with copious quotations from Scripture. Spinoza patiently exposes the Old Testament prophets' claims to be conduits for divine communication, but he reserves a role for Christian charity and humility as attitudes to be fostered through religious observance.

Both philosophers recognize that colours and other sensory qualities are relational, depending on the interaction of our minds with external objects, and that good and evil and other value properties depend as well on our interests and cannot reside in unexperienced states and events (*Lev.* 39; Spinoza 2007 [1670]: 51), though both are committed at the same time to the position that there are (p. 538) objectively better and worse lives and better and worse laws and governments. They saw themselves as extending the mechanical philosophy to the realm of human psychology, the better to control it. Hobbes was as uninterested in the individual perfectionist ideals advanced by Spinoza in his *Ethics* as he was scornful of the anti-authoritarian friendship model of civic relations that Spinoza was trying to revive, but both believed that ordinary people can and must make themselves into more disciplined social actors. And as Hobbes used the classical figure of the human being in the state of nature to exaggerate the miseries of men uninformed by a metaphysically correct political theory, Spinoza used the classical figure of the slave of the passions to exaggerate the miseries of those whose morals are uninformed by the correct theory of human experience and emotion. Spinoza maintained that knowledge of nature is divine and that repression of religious belief is self-defeating and produces unrest and civil disturbance; Hobbes had earlier declared forcefully that power is best served 'by Wisdome, Humility, Clearnesse of Doctrine, and sincerity of Conservation; and not by suppression of the Naturall Sciences, and of the Morality of Naturall Reason' (*Lev.* 480).

## 22.7 Conclusions

Hobbes deployed two conflicting images of humanity in his writings. One image was, as is often noted, 'atomistic' in the most superficial sense. In describing individuals, Hobbes noted their competitive instincts, their natural unsociability, their 'perpetuall and restlesse desire of Power after power, that ceaseth only in Death' (*Lev.* 70). He characterizes men in the state of nature as faithless, duplicitous, and self-serving. They have no spontaneous inclination to be citizens, or even to cooperate with their fellows. They are psychologically incapable of entering into binding non-hostility compacts with one another, for 'in the condition of Meer Nature ... upon any reasonable suspension, [the Contract] is Voyd' (*Lev.* 96).

This is the image that appears historically innovative in Hobbes, and that supports his harsh critique of ancient political philosophy, which, viewed through a Hobbesian lens, appears saturated with ideological assumptions about the harmony of interests of all classes and the rule of the naturally able. It is as well the image that has influenced many contemporary contractualists. David Gauthier, in his account of the market as a morally free zone, says with evident approval that Hobbes offers 'the most unified and compelling psychological portrayal of economic man', man 'freed from compulsory affective dependence ... incapable of voluntary affection'. The society, he continues, 'that, with matchless consistency, [Hobbes] generates from purely asocial motivations, is primarily an instrument for (p. 539) cutting the costs of human interaction, for eliminating the hostility found in the natural condition of humankind' (Gauthier 1986: 319). The other image of Hobbes is, however, surprisingly classical and benign. It differs from the images of Plato, Aristotle, and Cicero in its emphasis on manufacture over knowledge as the essential characteristic of human beings that best expresses their nature. Hobbes

assumes a propensity for cooperation, and he assumes that human interactions are remarkably productive. The species deserves to be proud of its collective achievements under civilization and confident about the possibility of a future without war. Hobbes' practical idealism surpassed, in this respect, all the metaphysical idealism of his authoritarian critics. Men, he believed, though naturally unsociable, purely material and mechanical in all their operations, inhabiting a universe without souls or gods, can be persuaded of their true interests and led to exorcize their irrationality and to suppress their selfish ambitions.

Hobbes has been accused of reversing the Grotian natural law tradition, of adopting a more Machiavellian approach to power and exhibiting a rather bellicose orientation that contrasts with Grotius' attempt to moderate behaviour in circumstances of armed conflict (Korab-Karpowicz 2006: 69). Yet there is an unmistakably idealistic and pacifistic strain in Hobbes' political thought that this chapter has tried to highlight. Leo Strauss has argued that Hobbes moved from admiring expertise with arms, valour in combat, and aristocratic mores to viewing the desire for honour as a destructive passion and honour itself as a quality attributed but not possessed.<sup>19</sup> The oscillation between warfare and idleness that had characterized aristocratic life for so much of the history of civilization demanded to be replaced, in Hobbes' view, by productive activity and the enjoyment of culture. The transformation of a restless, semi-civilized populace into disciplined, rational, social actors could culminate in the transformation of jealous nations and their jostling citizens into a productive global society. Where Grotius wanted to make war less barbarous and more humane, Hobbes saw through to the possibility of abolishing it.

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## Notes:

(1) Originally written in English, *Leviathan* was translated into Dutch (1667), Latin (1668), and German (1794), though not into French until 1921 (Book I) and 1971 (complete). Continental readers knew of Hobbes' views through *De cive* (Amsterdam 1649 and later editions), which covers much of the same ground; the Latin version of *Leviathan* was included in Hobbes' *Opera Omnia* of 1668, published in Amsterdam. For further details see Malcolm 2002: 457–545.

(2) On Hobbes' intellectual career see especially Skinner, 'Hobbes and the Studia Humanitatis' and 'Hobbes' Changing Conception of Civil Science' in Skinner 2002: 38–65; and Malcolm, 'A summary biography of Hobbes', in Malcolm 2002: 1–26.

(3) According to Malcolm, Bolduc was admired by Marin Mersenne, with whom Hobbes was in contact during his years in Paris in the 1630s and 1640s.

- (4) Leo Strauss' influential study seems nevertheless to overstate the role played by fear of violent death: 'Hobbes prefers the negative expression "avoiding death" to the positive expression "preserving life": because we feel death and not life; because we fear death immediately and directly, while we desire life only because rational reflection tells us that it is the condition of our happiness; because we fear death infinitely more than we desire life' (Strauss 1952: 16). 'It is the fearfulness of death rather than the sweetness of life which makes man cling to existence' (Strauss 1952: 124–5).
- (5) On Hobbes' early Ciceronian phase see Ludwig 2005.
- (6) Hoekstra 2006 argues that for Hobbes benefit is of more importance than sincerity, disclosure, or truth.
- (7) Darwall (2000: 336) points out that his commitment to an objective sense of good appears to conflict with Hobbes' subjective theory of value but that his 'projectivism' about value properties can support an intersubjective notion of good.
- (8) Cf. Cicero: '[H]uman nature is so constituted at birth as to possess an innate element of civic and national feeling, termed in Greek *politikon*; consequently all the actions of every virtue will be in harmony with the human affection and solidarity I have described' (Cicero 1928: 469).
- (9) Thus Aristotle: 'That some should rule and others be ruled is a thing not only necessary, but expedient; from the hour of their birth, some are marked out for subjection, others for rule' (*Politics* I, ch 5: 1254a–b; AR, 2: 1990).
- (10) 'There is no Man by Nature Slave to another, that is, in his primitive State considered, independently of any human Fact ... in which Sense we may take the Lawyers, when they say that Slavery is against Nature, but it is not repugnant to natural Justice, that Men should become Slaves by a human Fact, that is by Vertue of some Agreement, or in Consequence of some Crime' (Grotius 2005, III: 1360).
- (11) 'Men lived by spoil and plunder;/Friend was not safe from friend, nor father safe/From son-in-law, and kindness rare between/Brother and brother; husbands plotted death/For wives and wives for husbands; stepmothers/With murderous hearts brewed devilish aconite,/And sons, importunate to glut their greed,/Studied the stars to time their fathers' death./Honour and love lay vanquished' (Ovid 1986: 5).
- (12) 'All nature is self-preserving and has before it the end and aim of maintaining itself in the best possible condition of its kind' (Cicero 1931: 421).
- (13) Bernard Baumrin (1989: 119) claims that 'modern moral and political theory begins with Hobbes', and observes that 'that beginning springs from his theory of equality, the social ramifications of which have not yet been entirely digested even in the west'.
- (14) As Joannis D. Evrigenis points out (2007: 106–7), Hobbes takes the notion of a *summum malum* as his point of departure; see also note 4 above.
- (15) On Hobbes' constructive influence see Malcolm 2002, especially 535–45 and Goldenbaum 2011. On contemporary contractualism see Hampton 1986, Gauthier 1986, and Kavka 1986.
- (16) For a survey of contemporary English reactions to Hobbes and comprehensive bibliography see Mintz 1962.
- (17) On the problem of double authority in Hobbes, see Shapin and Schaffer 1985: 80–109.
- (18) According to his friend and supporter, John Aubrey, Hobbes said (employing the metaphor of a javelin-throwing contest) that Spinoza 'has outthrown me a bar's length; I durst not write so boldly' (Aubrey 1898, 1: 357). See on this passage Curley 1992.
- (19) Strauss 1952: 113–15, 47–50.
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## John Locke's Two Treatises of Government

A. John Simmons

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### Abstract and Keywords

This chapter examines John Locke's work entitled *Two Treatises of Government*. It suggests that this work helped revitalize the social contract tradition by extending the elements of Calvinist political thought, and expanded the modern natural law tradition of Hugo Grotius and Samuel von Pufendorf. The chapter also contends that this work represents Locke's defense of his political philosophy and of the Whig political principles.

Keywords: Two Treatises, John Locke, social contract, Calvinist political thought, natural law, Hugo Grotius, Samuel von Pufendorf, political philosophy, political principles

THE *Two Treatises*, along with the *Letters Concerning Toleration*, constitute Locke's mature statement and defence of his political philosophy. The *Two Treatises* was also, of course, the most complete, systematic, and philosophically sophisticated defence of the Whig political principles of Locke's day. Its immediate practical influence, both in England and in the later 'rights revolutions' in America and France, was considerable. Its theoretical influence, while cut short somewhat in Britain by the rise of utilitarian scepticism (about both natural law theory and social contract theory), was enormously far-reaching, and in fact can be seen in many basic features of contemporary political philosophy (see below). But in both their practical and their theoretical influences, what was transmitted was not always clearly part of the intended content of the *Two Treatises*. As just one simple example, Locke's political philosophy inspired and enlightened many whose views of legitimate political authority were considerably more democratic than Locke's own (which appeared to favour a 'moderated monarchy' (TT II. 143, 159) over more purely democratic forms of government).

The *Two Treatises* was published in 1690, shortly after the Glorious Revolution placed King William on the

throne. By all indications, however, the treatises were (p. 543) written rather earlier,<sup>1</sup> while Locke was living in the household of the Earl of Shaftesbury, a leader of the Whig opposition. They may have been written at Shaftesbury's request, in order to provide a comprehensive and theoretical justification for the exclusion of and, later, resistance to, the Catholic King James II. Locke's earliest writings in moral and political philosophy (from the early 1660s) defend views that bear little resemblance to his mature positions. Indeed, his early *Two Tracts on Government* defend an authoritarianism that more closely resembles that of Hobbes than it does the 'limited government' stance of the *Two Treatises*. It was undoubtedly Locke's association with Shaftesbury, along with Locke's own evolving views on the right to religious toleration—and on the corresponding limits to the magistrate's authority that such rights entailed—that swung Locke's positions towards the ones that we today associate with his name. It is hard to say how much of this shift should be attributed to evolving political circumstances and personal connections and how much simply to philosophical enlightenment.

While the treatises were thus partly motivated by the practical political crises of Locke's day and were partly addressed to his contemporaries in their practical political deliberations, the treatises were plainly far more than just occasional political tracts. Locke was, first and foremost, a philosopher, and the *Two Treatises* is a comprehensive and wide-ranging philosophical work. Its lasting interest and influence plainly depends on that fact. The *Two Treatises* revitalized the social contract tradition, extending in a much more philosophically sophisticated fashion elements of Calvinist political thought (as represented in earlier Huguenot, Scottish, and Puritan works). The *Two Treatises* helped to extend and expand the modern natural law tradition of Grotius and Pufendorf. And it established the basic argumentative structure of much later liberal and libertarian political philosophy.<sup>2</sup>

In the England of his own day, Locke's intellectual reputation was based primarily on his *Essay concerning Human Understanding*, not on his political philosophy. With respect to his political writings, Locke was extremely cautious, publically acknowledging his authorship of the *Two Treatises* and *A Letter Concerning Toleration* only in his will. Locke wrote in dangerous times, and there is evidence not only that the *Treatises* were intended to convey a radical, revolutionary message, but that Locke himself was involved in revolutionary plotting.<sup>3</sup> Any intended philosophical connections (or, indeed, any, presumably unintended, inconsistencies) between Locke's epistemological work in the *Essay* and his political philosophy (p. 544) in the *Two Treatises*, are unclear. Locke made no attempt to relate the two, and scholars' views range from finding deeply important connections, to finding no connections at all, to finding deep inconsistencies.<sup>4</sup> The most obvious philosophical link between these two sources of Locke's lasting fame lies in the conceptions of morality and the associated views of human motivation in the two works.

## 23.1 Natural Freedom and Equality

The most fundamental thesis of the *Two Treatises* is that of the natural freedom and equality of mankind.<sup>5</sup> It is with a defence of this thesis that Locke chooses to begin the argument of the 'Second Treatise' (II. 4). And it is Filmer's denial of this thesis that Locke targets for attack at the start of the 'First Treatise' (I. 3–4). The 'First Treatise's' principal objective is to defeat the patriarchalist theory that Filmer employs to reject the thesis, while the 'Second Treatise' explores the implications of the thesis for the proper understanding of the nature, origin, and legitimate extent of political authority (or 'political power', as Locke more often prefers to say (e.g. II. 2–3)<sup>6</sup>). By 'natural equality', of course, Locke does not mean physical or mental equality in, say, strength or wit. He has in mind a kind of moral equality, to which all persons are born.<sup>7</sup> This natural moral equality consists, first, in persons' equal subjection to (and equal protection under) God's law for humankind, the law of nature,<sup>8</sup> and, second, in their equality 'of Jurisdiction or Dominion one over another' (II. 54).<sup>9</sup> By 'natural freedom' Locke refers to the moral right of rational beings 'to order their Actions, and dispose of their Possessions, and Persons as they

think fit, within the bounds of the Law of Nature, without asking leave, or depending upon the Will of any other Man' (II. 4). Persons are free to make (p. 545) their own choices and control their own lives within these 'bounds' and others are obligated to refrain from interfering.

By calling our natural 'jurisdiction' equal (or 'reciprocal, no one having more than another' (II. 4)), Locke means only that no mature person is naturally subject to the authority of another, such that another can legitimately impose his will. Only things that rational beings *do*, not who they are, can ('artificially' or 'non-naturally') create authority relations between them (always assuming, as Locke does, that there is no 'manifest declaration of [God's] Will' which gives some persons authority over others (II. 4)). But if there are no natural authority relations between persons, then persons are naturally free to act as authorities over themselves, which is precisely the idea of natural freedom that Locke defends. Our natural equality of jurisdiction implies that we are naturally free to govern ourselves according to our own wills, subject only to the constraints set by the law of nature. The notions of natural freedom and natural equality, then, are so often appealed to together in Locke precisely because of this intimate logical relation between them. Those who support (or oppose) the one are, Locke believes, committed to supporting (or opposing) the other.

The point of starting each of the treatises with a defence of the thesis of natural equality and freedom is to announce Locke's opposition to other familiar alleged foundations of legitimate authority, which can be collected together under the title of 'political naturalism'. According to the political naturalist, government and political authority are parts of the world's natural order. Drawing on Aristotle's view that 'every state exists by nature' (*Politics* I. ii; cf. AR: 2, 1988) and on Paul's doctrine that all authorities 'that exist have been instituted by God' (Romans 13: 1–2), some naturalists in Locke's time developed claims that royal authority is a matter of 'divine right'. Superior power, social class, and custom were also widely taken to reflect a natural order of authority and subjection. Such naturalism was one of Locke's principal targets in the *Two Treatises*; and in particular, of course, he targeted the naturalism of Filmer. According to Filmer, the political authority of the Stuart monarchs was natural, absolute, and paternal (*Patriarcha* I, 3–4; Filmer 1680: 11–13). This authority derived from the original authority granted by God to Adam over his offspring and the world, handed down through the ages by repeated divisions and bequests. Locke's 'First Treatise' demolishes Filmer's position, successfully (and tediously) challenging both its scriptural interpretation and its logic. But Locke proceeds from his polemic against Filmer to a much more general rejection of all allied forms of naturalism, a rejection expressed in the thesis of natural equality and freedom.

If persons are naturally free and equal, however, it is incumbent on Locke to explain how persons could be taken to have departed from this natural condition, thus legitimating certain kinds of inequality and authority relations between them. In particular, if Locke is to avoid the anarchistic conclusion that 'all Government in the World is the product only of Force and Violence' (II. 1)—that is, if he is going to (p. 546) defend the possibility of rightful, legitimate political authority (and the 'lawful government' of the new King William<sup>10</sup>)—he must explain how our natural freedom and equality can be taken to be consistent with the inequality and authority that legitimate polities necessarily involve. The argument of the 'Second Treatise' can be understood to be structured around this task. Locke aims to explain and distinguish the various ways in which one person can come to have authority ('power') over another, thus acquiring 'unequal jurisdiction' over others, along with its implied legitimate limitations on the freedom of others.

Thus, Locke's arguments in the treatises revolve around the distinction between 'political power'—the central concept of the *Two Treatises*, which Locke aims to 'understand right' (II. 4)—and two other kinds of authority with which Locke took political power to be regularly confused: namely, 'parental (or paternal) power' and 'despotical power'. The distinction between these three kinds of authority is summarized in a separate chapter of the 'Second Treatise' (chapter XV). And the 'First Treatise', of course, is largely about Filmer's conflation of these three kinds of authority, for Filmer understood political power as a kind of paternal power that is despotical (or

absolute) in extent. Locke, by contrast, argues for a fundamental difference between the three. Parental power can be exercised only over one's minor child and only for the good of the child. Despotical power can be exercised only over those who have forfeited their own moral standing by committing acts that deserve a punishment of death (that is, acts that involve attempts to enslave or kill innocent others), and only such despotical power over others can be unlimited in purpose and extent. Political power, Locke argues, can be exercised only over free persons who freely consent to be subjected to it, and it can be employed only for the common good of those subjects.

Political power can thus be distinguished from the other possible forms of authority by its legitimate origin (consent, rather than procreation/benefaction or rights-forfeiture), by its legitimate subjects (free, rational persons, rather than minors or irrational 'war-makers'), and by its legitimate objects (the common good, rather than control/tuition of a minor or the despotical whims of the power-holder). And this distinction rests directly on the thesis of natural equality and freedom. Until we become free, rational, mature persons, we can be legitimately controlled by our parents or guardians in ways that facilitate our becoming free. If we choose to reject reason and its laws of freedom, making ourselves like wild beasts to those around us, we can be used or disposed of by others at will. But rational, innocent persons are all moral equals, no longer in need of parental control and fully entitled to live freely lives of their own. Thus, Locke believes, only the free consent of such persons could subject them to the legitimate authority of others.

(p. 547) While contemporary political philosophers, of course, seldom use the language of 'natural equality' or 'natural freedom', Locke's influential defence of his fundamental thesis is certainly partly responsible for the widespread acceptance of that thesis as a starting point in political philosophy today. Few today defend any strong form of political naturalism, virtually all accepting that persons are 'born to' a basic moral equality and freedom from the jurisdiction of others (other than parental jurisdiction). Contemporary philosophers and political theorists mostly attack the Lockean approach not at this starting point, but rather at Locke's inference from it to the necessity of *consent* for political authority. Rival conceptions of political authority (and political obligation) find its origins in, for instance, the moral requirement of fair play between cooperating persons or in the requirement that persons create and support political authorities in order to make possible the institutional structures without which justice cannot be done. This latter requirement (which is emphasized, for instance, in John Rawls' influential political philosophy) reintroduces an element of naturalism, by insisting that all persons have a natural duty to subject themselves to *some* just authority. But that, of course, is a far cry from traditional naturalism's insistence that existing social and political orders and the distribution of 'the powers that be' reflect a natural or a divinely ordained hierarchy of authority.

While Locke tells us that the 'State all Men are naturally in' is one of '*perfect Freedom ... [and] Equality*' (II. 4), we must be careful to remember exactly what he means here by 'men' and 'naturally'. Locke, of course, famously proceeds from the defence of this thesis to discuss 'the state of nature', the moral law that governs it, and the problems that afflict life in the state of nature (and that make life in civil society a more rational choice). And we know from that discussion that life in a state of nature will involve parents and their children (hence, parental power) and makers of unjust war who can be rightfully killed or enslaved (hence, despotical power). That is, any real state of nature will involve plenty of authority and inequality. So it might seem that Locke, in speaking of the state of nature, can hardly be talking any more about that natural condition of mankind in which all enjoy 'equality of jurisdiction' and perfect freedom from the authority of others. But we should remember that by 'men' Locke here means, first, mature persons who are sufficiently rational to no longer be subject to their parents' authority (II. 59–61) and, second, persons who have not abandoned the rational guidance of the moral law, made themselves like 'Beasts of Prey' (II. 16), and thus forfeited their lives (II. 23). Once 'men' is taken to exclude these classes of humans (along with those others, like the insane or the seriously retarded, who lack the capacity for the rational guidance of conduct), then Locke can indeed speak consistently of a state of nature in which 'all men are free and equal'.

Even were that not true, however, the state of nature (with its supposed equal jurisdiction among all men) could still be clearly contrasted by Locke with the *civil* condition, in which some men have legitimate *political* jurisdiction (authority) (p. 548) over others. For parental and despotical power are, as we have seen, quite distinct from political power; so any inequalities of jurisdiction with respect to children and war-makers will not challenge Locke's basic claims of mankind's naturally equal *political* jurisdiction and natural freedom from political authority. Even once this is clear, however, it is still easy to misunderstand Locke's use of the idea of the state of nature—especially if we come to Locke straight from a reading of Hobbes, as students of philosophy and political theory routinely do.<sup>11</sup> In Hobbes, the state of nature is any social condition in which people live together without a sufficient power over them to keep them in 'awe' and thus preserve civil peace. This cannot, however, be the account that Locke has in mind, for Locke says both that 'all *Princes* and Rulers of *Independent* Governments all through the World, are in a State of Nature' (II. 14) and that 'all Men are naturally in that State, and remain so, till by their own Consents they make themselves Members of some Politick Society' (II. 15).

Locke is saying, it seems, that each of us is born into the state of nature, regardless of how stable or undisturbed the social environment in which we begin life. Locke's state of nature must, as a result, be understood to be not a (dangerous or anarchic) *social* condition, but rather to be a *moral* relationship in which persons may stand towards others. Locke's view appears to be that persons in the state of nature together are those who are bound only by natural law with respect to each other; we are *out* of the state of nature with respect to other persons—in which case we are *in* civil society together with them (which is the relevant contrast)—when in addition to the duties of natural law, we owe one another the reciprocal political obligations that come with membership in the same legitimate political society. Since such political membership can, in Locke's view, originate only in consent, it follows that two persons are in the state of nature with respect to each other if they are *not* consenting members of the same society. So all persons are, as Locke says, born into the state of nature, and they must remain in it with respect to all others at least until they reach the age of consent. And, barring the creation of a single world polity, each of us remains in the state of nature with respect to many (in Locke's view most, and in some cases all) others for our entire lives. Further, residents of illegitimate polities, who are not bound to each other by reciprocal consent, are in the state of nature as well (with respect to both each other and their political superiors), again no matter how smoothly their societies may be functioning. Such persons may be living together without aggression, and they may be subject to the law-like coercive structure imposed on them by 'superiors', but they are not in a *civil* condition, either with one another or with those superiors.<sup>12</sup>

(p. 549) What perhaps makes this hard to see is that Locke, like Hobbes, uses his discussion of the problems of life in 'the state of nature' to motivate an account of the appropriate political solution to those problems. But if the meaning of Locke's state of nature is the one described above, there can be no account of *the* problems of life in *the* state of nature. The problems of children living in ordered societies, of persons living in peaceful but illegitimate (uncivil, non-consensual) societies, and of persons living in an anarchic 'natural' condition will be quite different kinds of problems. What Locke fails to make clear is that his discussion of the problems of life in the state of nature is, unlike Hobbes' parallel discussion, a discussion of the problems of only *one kind* of condition in which people are in the state of nature with respect to others—namely, that condition in which all are in the state of nature (morally speaking) with respect to everyone else, and in which there is no illegitimate agency that coercively imposes order on them.

It is the problems of life in such a complete and disordered state of nature that Locke famously summarizes in II. 123–7. Because nobody in such a condition has yet agreed to transfer any of their basic natural rights to some central authority, each person retains those rights, importantly including the equal natural right to enforce the law of nature 'so far as calm reason and conscience dictates' (II. 8). But where each person (correctly) takes himself to be individually entitled to enforce God's moral law, even if he genuinely attempts to do so conscientiously, he will tend to disagree with others about precisely what that law requires, to be biased in his application of that law towards himself and those about whom he cares, and to simply lack the physical power to enforce the law



against powerful and dangerous wrongdoers. The result will inevitably be unstable enforcement efforts combined with regular strife, discord, and possible war even between the conscientious.

The reasonable remedy for such problems, Locke argues, is a civil society with limited authority over its members and a government entrusted with the impartial exercise of that authority. If each member surrenders to society (and, ultimately, to government) the right to privately and conscientiously enforce the law of nature, the result will be a government with the right and the duty to impartially interpret and enforce the law of nature (and to make and enforce any other laws necessary for a viable society), a government backed by the force of all of its society's members. The existence of such an impartial authority with a 'monopoly' on the use of executive force solves the problems of the state of nature and constitutes the mark of civil society—all provided that it exists with the consent of those subject to it. But only if this authority is limited—in the ways listed by Locke in chapter XI of the 'Second Treatise'—will the conditions of persons be improved over those they could expect to endure in an unstructured state of nature. Life under an absolute, unlimited government of the sort favoured by Hobbes, Locke argues, would simply amplify the very problems of life in the state of nature to which civil government is supposed to be the remedy (II. 13, 92–3).

(p. 550) Hobbes and Locke agree, of course, that the danger of war in an unstructured state of nature is an important reason for preferring the civil condition to the state of nature. But where Hobbes thinks that any state of nature must inevitably become an active 'war of all against all', Locke thinks of such a state of war as only one possible character that the state of nature might have (and he criticizes those men who 'have confounded' the two states (II. 19)). Indeed, Hobbes' proposed remedy for the war that the state of nature must involve—namely, absolute monarchy—itself *constitutes* a condition of war for Locke. War, Locke argues, requires a sign of 'a sedate settled Design, upon another Mans Life' (II. 16). But because our freedom is 'the fence' to our preservation, 'he who makes an *attempt to enslave* me' makes war upon me just as clearly as one who tries to kill me (II. 17). The absolute, unlimited government championed by Hobbes leaves the sovereign morally free (and typically sufficiently powerful) to do as he will with his subjects. That, however, is to reduce those subjects to the moral status of slaves. So the attempt to wield absolute political power over others constitutes in itself a declaration of war against them. Political absolutism is simply the condition of personal slavery writ large.<sup>13</sup>

Locke's *Two Treatises* presents a case against all the familiar purported justifications for human slavery save one. Against the Aristotelian idea that some are 'slaves by nature', Locke brings to bear the arguments for the natural equality and freedom of all persons. Against the Filmerian idea that parents own their children (as lords own their slaves), Locke counters with the arguments that parental power is limited to what is necessary for the good of the child. Against the idea that force and conquest can justify enslaving the conquered, Locke argues that unjust uses of force to enslave others cannot increase the rights of the conqueror, but in fact results in the forfeiture of the conqueror's own rights. And against the Grotian and Hobbesian idea that we can freely *give* another absolute power over us, thus justifying our enslavement by our own consent, Locke maintains that, lacking the right to take away our own lives, we can hardly give such a right to others (II. 23).

The only possible justification for slavery, Locke claims, derives from the absolute, despotical power that one who subdues an unjust war-maker may wield over the wrongdoer. The only *legitimate* condition of slavery (what Locke calls 'the perfect condition of *Slavery*') is 'nothing else, but *the State of War continued, between a lawful Conquerour, and a Captive*' (II. 24). Notice, however, the obvious significance of this claim. If unjust war-makers may be justifiably killed or enslaved—because in making war they have forfeited all of the basic moral rights of persons (II. 85, 172–3)—then if the Catholic king can be portrayed as having made war on his innocent subjects (by attacking their liberties and threatening to sell them into subjection to a foreign prince), that king may not only be justifiably (p. 551) resisted (by *anyone!*), but may be imprisoned or killed as well. And the closing chapter of the 'Second Treatise' appears to include precisely an effort so to portray James II (e.g. II. 227, 232, 239).



This reading suggests that the *Treatises* represent a defence of the most radical Whig position, opposed to the more moderate views that tyrannical kings may be resisted only by the people's representatives (or 'lesser magistrates') or that kings may be removed but not personally harmed. So while the threat of war in a state of nature may play only a minor role in Locke's justification of the state (since even *without* war there are 'inconveniences' in the state of nature sufficient for that justification), Locke's analysis of war and of the moral justification for slavery clearly play a major role in both his theoretical rejection of political absolutism and in his practical justification for subversive resistance to his king. And Locke's case against political absolutism proved sufficiently powerful that it, in effect, ended the possibility of its defence within the natural law framework and firmly established for the future this foundation for all liberal theorizing in political philosophy.

## 23.2 Consent, Contract, and Revolution

What basis for political authority could be plausibly taken to be consistent with the natural freedom and equality of all persons? Locke's answer is that only a basis that involves the *exercise* of our moral freedom and equality can suffice—namely, our free, equal choice to subject ourselves to the (unequal) authority of others. So: 'no one can be put out of [the state of natural freedom and equality] and subjected to the Political Power of another, without his own *Consent*'. But '[w]hen any number of Men have so *consented to make one Community* ... , they are thereby ... incorporated, and make *one Body Politick*, wherein the *Majority* have a Right to act and conclude the rest' (II. 95).

This passage describes the first 'stage' of Locke's social contract theory of political authority and political obligation. It is common for scholars of contractarian thought to distinguish two stages of the social contract in most contract theories: a 'contract of society' and a 'contract of government'.<sup>14</sup> The social contract described by Locke is better characterized as having *three* stages. The first stage is the 'contract of incorporation', in which all members freely consent to join themselves together as a political society, to undertake the obligations of membership, and to empower the majority to act for the body. In the second stage, the unified members select a form of government, either opting to act themselves as their own (p. 552) government (in 'a perfect *Democracy*' (II. 132)) or to entrust some person or body to govern on their behalf (in a monarchy or an oligarchy). And if they elect the latter of these two options, a third stage of the social contract then involves the delegation of political power to specific representatives of the people, who will perform the institutional roles defined by their chosen form of government. Each of the three stages involves the 'consent of the people', but only the first stage requires *unanimous* consent (after which the unanimously accepted procedure of majority rule operates).

This account of the social contract that must underlie any legitimate polity should be understood only as an analysis of the conceptually necessary features of civil society, not as a *social history* that actually characterizes all such societies. For Locke describes a variety of cases of legitimate polities that do not arise so neatly from anything like an explicit founders' contract. For instance, he discusses the political incorporation of families into monarchies (with the fathers as elected rulers), where all three stages of the contract are apparently accomplished at once through a 'tacit, and scarce avoidable consent' (II. 74–5). And he mentions societies that originate in ways that are, or that are subsequently rendered, quite illegitimate (by, say, usurpation of power), but which can in time be transformed into legitimate societies through earning the people's consent (II. 198). And even more obviously, of course, those of us lucky enough to live in legitimate polities seldom have participated in the founding of those societies. A person who is simply born within the territories of civil polities may, on reaching the age of consent, '[join] himself to and [incorporate] with any Government already made' (II. 89). One does this by accepting with one's own consent the terms of incorporation and the governmental authority established by the consent of that society's other members.

The terms of incorporation, to which consent must be given in any civil society, include for Locke the surrender of

each member's 'Executive Power of the Law of Nature' (Il. 88–9)—thus creating a neutral 'umpire' over society—the empowering of the majority to act for the whole, and the 'uniting' with society of 'those Possessions, which [one] has, or shall acquire' (Il. 120). The last of these terms has caused great contention among Locke scholars, being taken by some to indicate that for Locke all property is subject to redistribution by the society.<sup>15</sup> But I think it is clear that by 'possessions' Locke here means only 'possessions of land', and by 'uniting to' or 'joining with' he means something far less dramatic than 'giving to'. For Locke is in these passages trying to explain only how a society comes to have 'jurisdiction' over (that is, the right to make and enforce law within) a geographical territory (Il. 121) and how it may legitimately keep that territory from being 'dismembered' by its landowning subjects (Il. 117). When we 'join' our land to (p. 553) our society we simply make it a part of the society's territory, for the whole of which the society may then make and enforce just law.

Each of these terms of incorporation addresses one of Locke's chief concerns about the 'inconveniences' of life in the state of nature. The surrender (and centralization in government) of our natural right to enforce the law of nature deals with the state of nature's lack of a known, settled law, lack of a known, indifferent judge, and lack of enforcement power. Majority decision-making is necessary to constrain the (inconveniently) unrestricted liberty of individual members, without which constraint each would simply have 'as great a liberty, as ... in the State of Nature' (Il. 97) and no collective decision-making would be realistically possible. And joining our land to the society is necessary to the creation of a geographical territory to which the benefits of the rule of law can be uniformly delivered and within which members can be protected from alien encroachment.

Consent to these terms is required for genuine membership in—and political obligation to—any civil society. But the consent in question (as we have seen) need not be fully explicit. Locke famously distinguishes between the express consent given in oaths of allegiance or explicit promises and the tacit consent given in more subtle ways. In his principal discussion of tacit political consent (Il. 117–22), Locke suggests that one may tacitly consent to the laws and the authority of government simply by the 'Enjoyment, of any part of the Dominions of any Government', where 'enjoyment' can include taking ownership of land in the territories of a state or simply using those territories in other ways (e.g. for travel or lodging). Express consenters, Locke suggests, are 'perfect members' of the society, permanently bound to it (for as long as it lasts). But tacit consenters should be thought of more as guests in another's home, fully bound by the rules of that home while there, but free from those obligations the moment they leave it. Locke's arguments concerning express and tacit consent have been widely criticized, both for their internal inconsistency and for their philosophical implausibility. He is probably best read as attempting, rather unsuccessfully, to distinguish between either (1) those who help to create the society and those who merely join themselves to it, or (2) those with a serious and permanent stake in the society's long-term success and those with more temporary or transient interests in its stability.<sup>16</sup>

Regardless of how we choose to understand express and tacit consent, however, two points still need clarification. First, while the free consent of the people is necessary for legitimate political authority, that consent is clearly limited in its binding power. We cannot, for instance, give binding force to laws, even with our express consent, that are inconsistent with the law of nature, which 'stands as an Eternal Rule to all Men, *Legislators* as well as others' (Il. 135). Similarly, Locke stresses (as we have seen) that we cannot with our consent give another arbitrary, (p. 554) absolute power over us. Just as our consent is insufficient to make ourselves the legitimate slaves of another, so it is insufficient to legitimate the absolute dominion of prince or government. Second, Locke appears to take seriously the idea that the consent that is required for incorporation into a civil society is each individual's own consent. It has been popular, under the sway of John Rawls' influential employment of the idea of *hypothetical* consent, to suppose that Locke has in mind something similar—that is, that membership and political obligation require only that a hypothetical rational person *would* agree to incorporation into the society, not that each subject have actually done so.<sup>17</sup> But Locke's text seems plainly to indicate otherwise, repeatedly stressing that only persons' 'own consent' (Il. 15, 95, 119, 138, 139, 189), 'given separately in their turns' (Il. 117) by 'actually entering into' a compact (Il. 122), can suffice to subject them to

another's political power.

Once we understand Locke's three-stage social contract theory in the fashion suggested above, his famous and influential theory of justified political resistance falls out of the account almost trivially. Individual incorporation and choice of a form of government are, in a legitimate polity, accomplished by consent or contract. The polity in that form continues so long as it is not 'dissolved' (typically by foreign conquest), the people bound together by their shared consents to membership and government. But the third stage of the 'contract'—the empowering of specific representatives or 'governors' with the rights to make and enforce law—is, Locke contends, accomplished instead by a *trust*, the people standing as trustor and ultimate judge of the performance of their fiduciary agent(s). So, in the end, '*The People shall be Judge*' of 'how far they meant [the trust] should extend' (II. 240, 242). Should the trustor judge that the trustee is failing in the task with which it was entrusted (namely, to exercise the peoples' rights for their common good, while respecting the rights of individuals), then the trust must 'be *forfeited*, and the Power devolve into the hands of those that gave it' (II. 149).

Dissolution of *society*, Locke argues, returns each member to the state of nature (with respect to all other persons) (II. 211). But mere dissolution of *government*, caused by governors' breach of their trust, leaves the incorporated society and its institutional framework intact, its members still bound to one another (and to the majority's decisions) by their unanimous consents. The society is then free to remove its trustees (apparently with force, if necessary to respond to 'war' upon the people) and may entrust new representatives (such as the new King William) with the tasks of governing. Either executives or legislatures can breach their trusts; but Locke, of course, focuses on executive misconduct, concentrating on executive breaches such as seizing power from or altering the legislature or neglect in execution of the law (II. 212–21).

(p. 555) These claims, however, all plainly concern only the relationship between the people as a body and their governors. Locke goes further, extending this doctrine of justified resistance to cover instances of tyranny even in 'private Mens Cases' (II. 208): 'where the Body of the People, or any single Man, is deprived of their Right, or is under the Exercise of a power without right', they may resist 'whenever they judge the Cause of sufficient moment' (II. 168). Such thinking, of course, especially when combined with his views about the moral standing of tyrannical kings, suggests that Locke's views on justified resistance occupy a position near the anarchistic end of liberal political philosophy. They are views, however, that appear to flow quite naturally from the individualist theory of natural rights with which Locke begins. And they are views that plainly inspired many others who began with similar commitments (such as the author of the American *Declaration of Independence*).

## 23.3 Property

Locke's discussion of property, in chapter V of the 'Second Treatise', is one of the most influential portions of the *Treatises*, one that has been taken seriously by and affected the arguments of the whole spectrum of thinkers on the subject—from the young Marx and the early socialists, to liberals and left-libertarians, to more conservative right-libertarian theorists. This chapter continues to be the most studied single piece of genuinely philosophical writing on property in the history of the subject, and Locke's arguments are still being actively developed and criticized by philosophers, political theorists, and legal academics. (Indeed, one of the standard, respected options in recent theories of *intellectual* property law is avowedly Lockean.) The reason for this attention is not difficult to discern. The central Lockean insight—that labour establishes a special claim to what is laboured on—captures an important strand in our deepest intuitions about our moral relationships to the external, material world. While many contemporary thinkers have criticized Locke's 'labour-mixing' arguments and the 'historical' theory of justice that Locke's theory of property suggests,<sup>18</sup> few have tried to deny the intuitive force of Locke's basic insight.

But for all its continuous influence on thinking about property, this chapter of the 'Second Treatise' nonetheless appears at first reading to be something of a fish out of water. It clearly stands out in the text, seeming to interrupt the otherwise continuous flow of the book's main argument, which (as we have seen) concerns (p. 556) the nature and extent of political power. This perhaps leaves the point of Locke's inclusion of the theory of property in the 'Second Treatise' somewhat mysterious. Undoubtedly one reason for its inclusion is that the idea of property plays an important role at several points in the arguments of the treatises, and that idea required explication. Equally obvious was Locke's desire to complete what he plainly regarded as a hitherto unsuccessful treatment of property in the natural law tradition, allowing property to be presented as a genuinely natural right, standing against the positivist, contractualist, and conventionalist analyses that were so common in earlier accounts. And, of course, if property can be successfully portrayed as a natural right—as opposed to a merely legal or conventional right—this might well seem to accord individual property rights a sanctity and an inviolability that could stand up in the face of a monarch's plans to extract funds from the people without the approval of Parliament or a monarch's threats to repossess former monastic lands for his church. So the theory of property developed in chapter V seems, despite its appearance of being 'tacked on' to the main argument of the text, to have had an important role in both Locke's theoretical and his practical political purposes.

Because the term 'property' appears in many places in the treatises, often with slightly different meanings, it is important to be clear from the start about Locke's intentions. First, of course, because Locke is defending the idea of property as a natural right, he is plainly talking about *moral*, not *legal*, ownership. Second, Locke's target in chapter V is an understanding of the original acquisition of property—that is, how one can come to own something that was previously unowned—and it is that question to which 'labour' is Locke's answer. Persons can subsequently come to be entitled to material things in a variety of other ways: for instance, through contract (gift, trade, bequest), as reparation for injuries (II. 10), or as a result of dire need (I. 42).

Finally, when Locke uses the term 'property' in the *Two Treatises*, he uses it with at least three different senses (or scopes). Most of the time in chapter V of the 'Second Treatise', Locke uses 'property' to refer to our rights in all external material goods—that is, in our 'estates', our land, and chattels. It is these kinds of property that Locke argues originate in labour.<sup>19</sup> Later, however, in chapter VIII of the 'Second Treatise', where Locke is discussing political consent, he suggests that in consenting to join a civil society, one must be understood as well to be joining one's property to that society (II. 120). There, as we have seen above, it seems clear that by 'property' Locke means specifically property only in *land*. Finally, Locke sometimes uses 'property' in his most general sense, where it means anything to which we have a moral right: your property is your 'Life, Liberty, and Estate'. Your (p. 557) property in this sense is just your right to 'dispose' of your own actions and possessions—that is, your right to govern yourself within the bounds of natural law, your 'natural freedom'. This broadest sense of 'property' is clearly stated in II. 87 and is, importantly, the sense used in the beginning of chapter IX, where Locke argues that '[t]he great and *chief end* ... of Mens uniting into Commonwealths, and putting themselves under Government, *is the Preservation of their Property*' (II. 124).

Locke's reasoning about our property in *external* things begins with a premise that religious and secular views could well share: that originally there was no private property in external goods or land. It was a matter of considerable debate in Locke's day whether the 'original community' of property was to be conceived of as negative—with no exclusive property rights at all—or as positive, with all things held jointly by all of humankind.<sup>20</sup> Whether we begin with 'reason's' deliverance that all have 'a right to their preservation', or 'revelation's' deliverance that God gave the world 'to Mankind in common' (II. 25), we can understand the starting point negatively or positively—that is, as involving no property at all, or as involving jointly held exclusive rights to the world. Locke's argument, I think, is intended to avoid that controversy by showing that private rights to property arise in such a way that it simply does not matter how we think about original community.

Locke's strategy is essentially to ask who, in a context in which nobody has an exclusive claim to any external

thing, could reasonably claim to be injured by someone's taking something to hold and use as his own, excluding other claimants. Regardless of whether the original community is negative or positive, Locke argues, nobody would be entitled to object to such private appropriation, at least provided that 'there is enough, and as good left in common for others' (II. 27). If I take no more than my fair share of land or natural goods, each other person is left with an equal opportunity to do the same, to use or appropriate their own fair shares of similar quality and quantity. In what way then can they claim to be wronged by my appropriation, except by insisting that they are not my natural equals and are somehow entitled to more than a fair share? This reasoning seems compelling whether the original community is negative or positive. If it is negative, there is no entitlement with which my new claim might be taken to conflict. If it is positive, unless my appropriation of a part somehow ruins the whole or makes similar appropriations of parts by all the other joint owners impossible, there seems no reasonable basis for them to object either. To deny this would be to argue, implausibly, that 'Children or Servants could not cut the Meat which their Father or Master had provided for them in common' (II. 29). Joint owners' consent to division of their property is unnecessary if they are not injured by that division.

(p. 558) Locke thus maintains that he can justify private appropriations of the original commons 'without any express Compact of all the Commoners' (II. 25). But the logic of the argument suggests that this justification would fail without the satisfaction of Locke's 'proviso': that appropriations leave enough and as good for others. This proviso has been widely discussed by contemporary theorists, with some trying to make do with weakened versions of it (Nozick 1974: 176) and others denying that it is really intended by Locke as a condition for legitimate appropriation at all.<sup>21</sup> But the form of Locke's argument suggests that the proviso, in the strong version that Locke states, must be satisfied if others are to have no reasonable grounds for complaint about private appropriation from a common lot.<sup>22</sup>

Why, though, not simply leave all external goods in common? Could anyone have any legitimate objection if there were no private property rights at all? Locke's answer has two parts. First, God gave mankind the earth and the animals 'to make use of it to the best advantage of Life', and it is necessary that private appropriation be possible before this bounty 'can do [man] any good for the support of his Life' (II. 26). On its face this claim seems false, since people could clearly *use* the world for the support of life without *owning* any of it. What seems true, though, is that for the rational pursuit of any even remotely complicated ongoing life plans (involving, say, building a dwelling place or growing food), persons must be able to claim as their own (and so exclude others from) that on which they labour. Second, Locke argues that when someone has laboured productively on some external resource, 'he has mixed his *Labour* with, and joyned to it something that is his own' (II. 27), so that it would be wrong for others to take or use it without the labourer's permission. For that would be to take what unquestionably belongs to the labourer, namely, the labour he invested in the resource.

This 'labour-mixing' argument has, of course, been thoroughly analysed and widely criticized in the vast literature on Locke's theory of property. But the fact remains that there is something deeply intuitive about it, which is the obvious source of the enduring appeal of Locke's theory. When others take what we have worked to produce, we regard them as having taken a part of *us* in the process. Many of those who find such claims ultimately incoherent have tried to render Locke's discussion respectable by suggesting that he was really concerned with the value that labour adds to a thing, with what hard workers deserve, or with the rights of creation. But Locke himself, in summarizing his case, chose to say none of that, but rather only that man has 'in himself the great foundation of property'; and Locke explains that claim by saying that man is 'Master of himself, and *Proprietor of his own Person*, and the Actions or *Labour* of it' (II. 44).

(p. 559) This wording, of course, suggests that Locke wants to tie very closely his justification for private property to his fundamental arguments for humankind's natural equality and freedom. Each person is naturally entitled to be 'master of himself', free of the jurisdiction of others. Each is naturally free to govern his own life according to his own plans. And those plans will naturally tend to include the ongoing use and consumption of resources in the



natural world. Provided that we govern ourselves within the bounds of natural law, our self-government gives others no legitimate grounds for complaint, for all may do the same. And provided that we keep to our fair share of what God has given to all, private appropriation of portions of the earth and its bounty likewise gives others no ground for complaint, for others remain entitled and able to do likewise. The parallel logic of the arguments seems plain, while their intuitive appeal and their 'fit' amply explain their enduring influence.

## 23.4 Family and State

The principal philosophical interest of the little-read 'First Treatise' lies in its discussions of the rights within and relating to the family. Filmer's theory itself has insufficient philosophical substance or appeal for the more narrowly critical aspects of Locke's refutation of Filmer to be of any contemporary relevance. Given the reliance of Filmer's position on his claims about the extent of paternal power and familial rights of inheritance and bequest, it is not surprising that Locke's arguments in the 'First Treatise' focus on those subjects as well. Further, of course, the apparently natural and non-consensual structure of authority relations within families presents an obvious challenge to Locke's arguments for natural equality and freedom. Locke's related discussion of parental and filial rights and duties in the 'Second Treatise' is clearly designed to provide a more systematic and comprehensive account of its topic than in the more polemical 'First Treatise'; and, not surprisingly, the 'Second Treatise's' arguments specially emphasize both the distinction between parental and political power and the ways in which 'parental rule' can evolve into a genuinely political relationship.

On the moral relationship between husband and wife, Locke's stated position is that it is 'founded on Contract' (I. 98; II. 78, 82–3); so the rights and duties of marriage are not different in kind (but are only different in content) from those that arise in any other contractual relationship—such as political relationships. The more challenging case for Locke—and the case with more relevance to his (and to Filmer's) position on political authority—is that of the moral relationship(s) between parents and children (to which we turn below). The most controversial (p. 560) aspect of Locke's comments on the 'conjugal society' created by a marriage contract is not his contractualism itself, but rather his suggestion that husbands have 'priority' 'in all things of their common Concernment' over their wives (I. 48), a right of 'last Determination' in 'things of their common Interest' (II. 82). Locke's (unconvincing) rationale for this position seems to be that men, being naturally 'the abler and the stronger' (II. 82), should be deferred to by their wives—at least if their marriage contract does not specify a different order of 'priority'.<sup>23</sup> The real problem here seems to be primarily the false and sexist premise on which Locke's argument is based. That the rights and duties of husbands and wives should turn on the agreements and understandings between them seems a worrisome view not in principle, but only in those cases where the marital partners have (as they typically *did* have in Locke's day) seriously unequal bargaining positions.

Locke's discussion of the moral relationship between parents and their children captures a great deal of common-sense thought on the subject, and it has, as a result, been followed in its main lines by many contemporary philosophical treatments of the topic. 'Parental power' (which Locke regularly slips into calling 'paternal' power) consists of the 'right of *Tuition*' and the 'right of *Honour*' with respect to one's children (II. 67). The former is a kind of 'temporary government' over the child, aimed at producing a healthy and independent adult (II. 58, 65), and entitling the parent to control over and obedience from the child. The 'right of honour' is a parental right both to the non-material respect and gratitude required by the Fifth Commandment (I. 64) and to material support (from a child who can afford it), should the parent need it later in life (II. 67). While Locke does occasionally suggest, with Filmer, that these parental rights derive from the mere biological relation between parents and children (e.g. I. 64; II. 52), his considered view seems to be quite different: the right of tuition derives from parents' divinely imposed *duty* to care for their children (and correlates with children's *right* to care) (II. 56, 58, 67); and the right of honour derives from the benefits parents provide for their children and is proportionate to

the extent of the benefits provided (I. 100; II. 65, 67, 70). Most important, of course (and in direct contrast to Filmer's view), these parental rights are not absolute, but are clearly limited in extent (to what is necessary for the well-being of the child), as well as forfeitable by parental abuse. Even, then, if political power *were* a kind of paternal power, Filmer's defence of political absolutism would fail.

As for the moral role of children, their duties are plainly intended to be to respect their parents' rights against them.<sup>24</sup> The principal children's rights (against their parents) mentioned by Locke are the right 'to be nourish'd and maintained by (p. 561) their Parents' until they 'are able to provide for themselves' (I. 89; II. 78) and the 'Right of Inheritance to their Fathers Property' (I. 93). Both rights are taken by Locke to be simple consequences of the parents' duty 'to preserve what they have begotten' (I. 88) and to see to their children's security and comfort. In connection with the right of inheritance, Locke denies the justice of 'primogeniture' (I. 93), arguing for an equal right of inheritance for each of a family's children. These compelling arguments once again strike at Filmer's story about how Adam's authority might have been inherited by contemporary kings.

Locke's persuasive rejection of Filmer's patriarchalism—and, more generally, of political paternalism—is one of the most important and influential contributions to political philosophy made by the *Two Treatises*, and it set the tone for subsequent liberal theorizing. Locke, of course, allows that it may be 'natural' for children, accustomed to their fathers' authority, to turn to those fathers as potential 'princes' or political authorities (II. 64). But he is clear as well that any change from a familial condition to a genuinely *civil* (i.e. legitimate political) one can be accomplished only by grown children's own consent (II. 75) (see Schochet 1975: 55–6, 256–61). The natural moral freedom and equality of all persons—that most fundamental thesis of the *Two Treatises*—requires that legitimate political subjection have a source that is consistent with such freedom and equality. And only free consent, Locke argues, can be such a source.

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## Notes:

(1) The most influential work on the dating of the *Treatises* was Laslett 1988; for a more recent study, see

Armitage 2004.

(2) For a different view of the contemporary relevance of the *Two Treatises*, see Dunn 1990.

(3) On Locke's revolutionary activities and the revolutionary content of his writings, see Ashcraft 1986. For a contrasting view, see Milton 1992.

(4) A summary and discussion of much of the literature on the relation of the *Essay* to the *Treatises* can be found in Grant 1987, ch. 1.

(5) While, of course, the same arguments Locke uses to establish the natural freedom and equality of 'men' seem to show as well the freedom and equality of women, I will follow Locke's usage here.

(6) That Locke means by 'power' rightful authority, rather than *physical* power, is made immediately clear: '*Political Power* then I take to be a *Right* of making Laws ... for the Publick Good' (II. 3).

(7) '*Children* ... are not born in this full state of *Equality*, though they are born to it. Their Parents have a sort of ... Jurisdiction over them when they come into the World ... but 'tis but a temporary one' (II. 55).

(8) On Locke's conception of the law of nature, and on his moral philosophy more generally, see Colman 1983.

(9) The relationship between Locke's religious beliefs and his belief in the natural equality of persons is explored, quite sympathetically, in Waldron 2002. Waldron also there discusses what he regards as unpromising possibilities for defending natural equality in secular terms. The classic study of the dependence of Locke's political philosophy on religious premises is in Dunn 1969, especially Part III.

(10) Locke's avowed purpose in the *Treatises* is to 'make good [King William's] Title, in the Consent of the People, ... the only one of all lawful Governments' (Preface, TT: 137).

(11) An excellent discussion of the relationship of Locke's thought to that of Hobbes—along with that of Filmer and the earlier natural law theorists—can be found in Harrison 2003.

(12) A full defence of this reading of Locke is in Simmons 1993: ch. 1.

(13) On the connection between slavery and political absolutism in Locke, see Farr 2008.

(14) See, e.g. Lessnoff 1986: 28–30.

(15) This reading is defended by many, but most prominently in Tully 1980: especially 99–105, 158–65.

(16) For a fuller discussion of these problems, see Simmons 2001.

(17) The most influential reading of this sort is in Pitkin 1965–1966.

(18) See, e.g. Waldron 1988: ch. 7.

(19) Notice, however, that Locke also refers in chapter V to our properties in our 'persons' and our bodies (II. 27), which far less obviously originate in our labour, and which are in fact best understood, in my view, as trusts granted to us by God, the original maker and ultimate owner of all things.

(20) In either case persons might or might not be thought to have private rights to *use*, but not to appropriate, external goods.

(21) For examples of two completely different ways in which Locke's proviso has been taken not to operate as a

limit on appropriation, see Macpherson 1962: 199, 211–13; and Waldron 1988: 209–18.

(22) For a fuller defence of this reading, see Simmons 1992: ch. 5.

(23) And Locke does mention marriage contracts in which women have specifically declined to grant their husbands such priority (e.g. I. 47; II. 65).

(24) Though it is, of course, awkward for Locke to ascribe either duties or rights to not-yet-rational beings who cannot know and conform their conduct to the law of nature.

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## **The Origin and Development of Property: Conventionalism, Unilateralism, and Colonialism**

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### **Abstract and Keywords**

This chapter examines the origin and development of the concept of property in Great Britain during the seventeenth century, particularly in relation to conventionalism, unilateralism, and colonialism, and provides an account of earlier versions of conventionalism in the works of Thomas Hobbes, Samuel von Pufendorf, and Hugo Grotius. It also offers a unilateralist interpretation of Locke's theory and highlights the problems in the relationship of his theory of appropriation to colonialism.

Keywords: property, Great Britain, conventionalism, unilateralism, colonialism, Thomas Hobbes, Samuel von Pufendorf, Hugo Grotius, theory of appropriation

A number of theorists in seventeenth-century Europe engaged in discussing property, and some of them provided accounts of the origin and development of property. Those accounts often formed parts of the foundations of political power and government, and were linked in some cases to the defence of colonialism. The seventeenth-century discourse on the origin and development of property was a complex one, and we would need a careful narrative to show its wide-ranging concerns and implications. But in this chapter I shall try to simplify what was actually complex, and concentrate on the two distinct lines of thought which figured prominently in the discourse. One is the conventionalist line represented by Grotius, Hobbes, and Pufendorf, which sought to justify property by appealing to a preceding compact. The other is the unilateralist line which was initially hinted at by Puritan colonists in America, and was later formulated in the theoretical (p. 564) language of Locke. The unilateralist theory did away with the old device of compact, and allowed each labourer to appropriate natural resources legitimately without the consent of others. Given this, we may treat the seventeenth-century discourse as revealing a process whereby Locke's unilateralist theory of appropriation came to be proposed as an alternative to the earlier conventionalist theories.

I intend to treat the discourse as culminating in Locke, so I shall devote greater space to his theory than to any other. There are three main tasks I want to undertake. First, I shall offer an account of the earlier versions of conventionalism we find in Grotius, Hobbes, and Pufendorf. Secondly, I shall show how Locke's unilateralist theory of appropriation emerged as an alternative to their conventionalist theories. This task naturally involves a presentation of my interpretation of Locke's theory as a unilateralist one. Thirdly, given this interpretation, I shall go on to address the problem about the relationship of Locke's theory of appropriation to colonialism, i.e. how it can justify dispossessing the Native Americans of their lands. This problem has attracted a number of commentators in recent years, but in my view it remains unsolved. The unilateralist interpretation I provide is designed to offer a solution, and it also allows us to see the significance and weaknesses of Locke's theory of appropriation. It seems fairly clear that the unilateralist theory, making the natives' consent unnecessary, is more suitable for colonial expansion than conventionalism. But I shall reject the currently influential 'colonial' reading of Locke, and offer an

alternative analysis of the relationship of Locke's unilateralism to colonialism.

## 24.1 Grotius' Compact Theory

When Grotius developed a theory of rights in his unpublished manuscript *De jure praedae* (1604–1606) or when he published its twelfth chapter as *Mare liberum* (1609), he clearly wanted to defend the Dutch interest in the East Indies.<sup>1</sup> But his mature work, *De jure belli ac pacis*, went beyond the immediate colonial context. It contained a comprehensive theory of rights and justice that subsequently attracted the attention of scholars, including those who wished to defend the English interest vis-à-vis the Dutch. In particular, Grotius' compact theory of property provided a model of what a theory of property might be like, and served as a common point of reference for a number of English thinkers including Selden,<sup>2</sup> (p. 565) Filmer,<sup>3</sup> Cumberland,<sup>4</sup> Tyrrell,<sup>5</sup> and Locke. In discussing Grotius' relationship to the subsequent English (and Scottish) discourse on property, we are justified in beginning with the theory of property presented in *De jure belli ac pacis* (2.2.1–5).

Grotius' compact theory takes the form of a narrative about the origin of property (*proprietas* or *dominium*). Grotius takes his narrative to be consistent with the biblical history, but he blends his own insights with it and supplements it with many quotations from ancient philosophers and poets. At the creation and after the flood, says Grotius, God gave all things to mankind in common, and every human being had a universal right of use to anything in the original community. In those days, this use right performed the function of what people later came to know as private property, but this original community gradually disappeared. People ceased to live 'in their primitive Simplicity' as 'some People of *America*' still do, or to live 'in perfect Friendship' as shown in 'the Example of the *Essenes*, of the primitive Christians at *Jerusalem*' (*De jure belli ac pacis* 2.2.2.1).<sup>6</sup> They were no longer satisfied with dwelling in caves, but they 'wanted to live in a more commodious and more agreeable Manner; to which End Labour and Industry was necessary'. Moreover, people were incapable of using common things because of 'the distance of Places where each was settled' or 'the Defect of Equity and Love' in them (2.2.2.4).

Given this background, Grotius goes on to state that private property 'was derived not from a mere internal Act of the Mind [non animi actu solo]', 'but it resulted from a certain Compact and Agreement, either expressly, as by a Division; or else tacitly, as by Seizure [sed pacto quodam aut expresso, ut per divisionem, aut tacito, ut per occupationem]' (*De jure belli ac pacis* 2.2.2.5). People needed a certain *pactum* (translated here as 'Compact and Agreement') because 'one could not possibly guess what others designed to appropriate to themselves, that he might abstain from it' and 'besides, several might have had a Mind to the same Thing' (*De jure belli ac pacis* 2.2.2.5).

A word is needed here to explain the Latin term *pactum*. Grotius takes it over from Roman law, and Ulpian explains its meaning as 'the agreement and consent of two or more persons about the same thing' (Mommesen and Krueger 1985: 2.14.2). It is an agreement of any kind involving two or more persons, including 'bare agreement' (*nudum pactum*), or a simple formless agreement. Grotius takes *pactum* to be an agreement or convergence of wills, as he states that 'Property ... , as now in use, was introduced by Man's Will' (*De jure belli ac pacis* 1.1.10.4). *Pactum* is (p. 566) binding presumably because like a promise, it is in conformity with 'the Nature of immutable Justice' which is common to God and all rational creatures (2.11.4.1).

In order to have a deeper understanding of Grotius' connections with later theorists, I should like to add that his compact theory of property is part of a larger theory of *suum*. Grotius holds that every man naturally has, as *suum* (i.e. what is his own), his 'Life', 'Body', 'Limbs', 'Reputation', 'Honour', and 'Actions' (*De jure belli ac pacis* 2.17.2.1). These are, by nature, included in the sphere of *suum*. This natural sphere can be legitimately extended by a compact to incorporate external possessions, so that each man's 'property' comes to be respected by the law of nature (1.1.10.4). To put it in the language of rights, *suum* is that which each man has a 'perfect' right in. Grotius calls the 'perfect' right 'a Faculty' (*facultas*), and links it to what Roman lawyers call *suum* (1.1.5). Unlike the 'imperfect' rights (e.g. a 'right' to charity), the

‘perfect’ ones are the rights in the proper or strict sense. They are the rights which can be protected or restored by the use of force, i.e. legal force, or bare physical force if a court does not function.<sup>7</sup> The word ‘right(s)’ captures what Grotius regards as the primary sense of *jus*, i.e. ‘a *moral Quality* annexed to the Person, *enabling him to have, or do, something justly*’ (1.1.4). Grotius makes the perfect rights the basis of justice, and claims that justice in the strict sense means *alieni abstinentia*, abstaining from what is another’s (*De jure belli ac pacis*: Prolegomena, 8 and 44), i.e. the preservation or restoration of another’s perfect rights. Correspondingly, we find the broader sense of ‘propriety’ or ‘property’ in modern British thinkers. In Hobbes, it encompasses one’s own ‘life, and limbs’, ‘those that concern conjugal affection’ (i.e. honour, reputation, etc.), and ‘riches and means of living’ (Hobbes 1998: 30.12); and in Locke, it includes one’s own life, health, liberty, and possessions (TT II. 6, 123). This broad sense can be understood as an analogue of Grotius’ *suum* or perfect rights. Hobbes’ remarks on justice and property, or Locke’s on the preservation of property, can be better appreciated in light of these remarks.

## 24.2 Two More Compact Theories: Hobbes and Pufendorf

The impact of Grotius’ theory was widely felt in seventeenth-century England. Of course, divines such as Gabriel Towerson continued to defend private property by quoting from the Decalogue (Towerson 1676), but it was increasingly clear that (p. 567) many wanted to defend it on an alternative basis, either on the basis of nature, or on an artificial agreement arising from nature. Grotius subscribed to the Stoic idea that human beings have natural sociability, and took the view that the just order of things is ultimately grounded in their natural sociability (*De jure belli ac pacis*: Prolegomena, 5–8). By contrast, Hobbes took the Epicurean position that nature knows no distinction between justice and injustice, or between *mine* and *thine*, and that the distinction arises from the performance of an artificial covenant made by human beings who pursue their self-interest.<sup>8</sup> In *Leviathan*, Hobbes developed a compact theory of property (albeit an indirect one, as we shall see), starting from the premise that every man by nature has ‘a right to every thing; even to one another’s body’ (Hobbes 1998: 14.4). This condition is ‘neither propriety, nor community’, but a state of ‘uncertainty’ (24.5). ‘[J]ustice and injustice have there no place’; consequently, there is ‘no propriety, no dominion, no *mine* and *thine* distinct’, and each man can possess what ‘he can get’ but it remains in his possession only ‘as long as he can keep it’ (13.13).

Given this initial state of uncertainty, Hobbes shows how men are moved to erect a coercive power, how the fear of punishment (which is ‘greater than the benefit they expect by the breach of their covenant’) moves them to perform their covenant, and how they can eventually ‘make good that propriety, which by mutual contract men acquire, in recompense of the universal right they abandon’ (Hobbes 1998: 15.3). Such a coercive power cannot be had ‘before the erection of a commonwealth’. Hobbes refers to the traditional definition of justice as ‘the constant will of giving to every man his own’, and states that ‘where there is no own, that is, no propriety, there is no injustice’, and ‘where there is no coercive power erected, that is, where there is no commonwealth, there is no propriety; all men having right to all things’ (15.3).

Thus for Hobbes, we must first explain the generation of a commonwealth if we want to explain the origin of justice and property. The only way to erect a common power is by making a ‘covenant of every man with every man’, which confers ‘all their power and strength upon one man, or upon one assembly of men’. This covenant is a device ‘to submit their wills, every one to his will, and their judgments, to his judgment’, establishing a real unity of all (Hobbes 1998: 17.13). The term ‘covenant’ denotes a particular kind of ‘contract’ by which one party performs his part, and ‘leave[s] the other to perform his part at some determinate time after’ and trusts the other party for the moment (14.11). The third law of nature requires that ‘*men perform their covenants made*’ (15.1) and the coercive power explains at least part of the binding force of a covenant (14.7; 15.31). In *De cive*, Hobbes uses the Latin term *pactum* for ‘covenant’. Like Grotius’, Hobbes’ *pactum* is an agreement of wills: ‘to covenant, is an act of the will’ (Hobbes 1998: 14.24). But since Hobbes (p. 568) defines the ‘will’ naturalistically as ‘*the last appetite in deliberating*’ (6.53), his *pactum* or covenant is actually an agreement of the different last appetites in deliberation.

A sovereign, who may be one man or one assembly, has ‘the whole power of prescribing the rules, whereby every man may

know, what goods he may enjoy, and what actions he may do' (Hobbes 1998: 18.10). This is what 'men call propriety' (in the broad sense), and 'this propriety, being necessary to peace, and depending on sovereign power, is the act of that power, in order to the public peace'. These 'rules of propriety' are part of 'the civil laws' or 'the laws of each commonwealth' (18.10). It follows that 'the propriety which a subject has in his lands', or a property in the narrow sense, excludes 'all other subjects from the use of them', without excluding the sovereign's right (24.7). Thus Hobbes' theory of property is an indirect kind of compact theory. Property (in the narrow sense) is derived from the rules for acquisition and transfer, while the rules themselves are made by the power of a sovereign instituted by the preceding compact or covenant of everyone with everyone else.

Pufendorf develops Grotius' compact theory by mingling Stoicism with a degree of Epicureanism, and also by introducing further distinctions to clarify Grotius' and Hobbes' positions. Like Grotius, Pufendorf grants the assumption of the original community of things. God allowed each human being a privilege of use, or 'an indefinite right' to the earth, its products, and its creatures (Pufendorf 1995: 4.4.4; 4.4.1). Pufendorf refers to the right as 'a common right for all', while quoting from Ambrose (4.4.4). He distinguishes between two kinds of community, 'positive' and 'negative', and the original community is a negative one where 'all things lay open to all men, and belonged no more to one than to another' (4.4.5). Those things which lie in common in the negative sense are 'not yet assigned to a particular person' though they can be so assigned, whereas things in a positive community belong exclusively to several human beings (4.4.2).

Given these premises, Pufendorf proceeds to offer a compact theory of property, which is similar to Grotius' but with more emphasis placed on social utility and practicality. *Pacta servanda sunt* ('agreements ought to be kept') is the requirement of 'the social nature of man', and 'if an agreement lacks this guarantee, much the largest part of the advantage' that mankind receives from mutual interchange of duties 'would be lost' (Pufendorf 1995: 3.4.2). With respect to the origin of property, Pufendorf claims that *pactum* is absolutely necessary: 'dominion presupposes absolutely an act of man and an agreement [pactum], whether tacit or express' (4.4.4). In this context, he repeatedly uses the word *conventio* as a synonym of *pactum*.<sup>9</sup> Pufendorf stresses that 'natural law clearly advised that men should (p. 569) by convention introduce the assignment of such things to individuals, according as it might be of advantage to human society' (4.4.4). There can be successive agreements 'as the state of things, or the nature and number of men, seemed to require' (4.4.6). But at least one antecedent agreement is required for the creation of property because the agreement alone can produce a 'moral' effect, while a mere physical act of seizure cannot. The moral effect in question is the 'obligation on the part of others to refrain from a thing already seized by some one else' (4.4.9). Pufendorf operates on the Grotian notion that property rights are moral qualities, and he claims that those rights are created because they are 'imposed', or 'superadded, at the will of intelligent entities, to things already existent and physically complete, and to their natural effects' (1.1.4).

## 24.3 The Making of a Unilateralist Theory: Locke

In Chapter V of the 'Second Treatise', Locke begins with the assumption of original community, and declares his intention to 'shew, how Men might come to have a *property* in several parts of that which God gave to Mankind in common, and that without any express Compact of all the Commoners' (TT II. 25). Locke introduces 'tacit' consent when he comes to account for the use of money as a common medium of exchange, and money functions to expand the property already acquired (II. 50; also 45, 47–9). But as far as the origin or beginning of property is concerned, Locke dispenses with the device of any consent or compact whatsoever.

Locke shared the assumption of original community with Grotius and Pufendorf. He retained it in spite of Filmer's critique of Grotius' view of the original community of things. Grotius' compact theory, according to Filmer, requires the kind of unanimous agreement which could not have been obtained. Given the number of people who inhabited different parts of the world, he says, they had a practical difficulty reaching a unanimous agreement; and if a single man had disagreed with the particular arrangement of property, that arrangement would have been pronounced as unjust. Filmer points out this difficulty, and urges us to abandon the initial assumption of original community, and to adopt instead that of Adam's private dominion.<sup>10</sup>



In his view, God gave the world exclusively to Adam, and God granted Adam the absolute, exclusive dominion over the world and the rest of mankind.

(p. 570) This is the basis of Filmer's defence of absolute monarchy, so Locke criticized it in Chapter IV of the 'First Treatise'. In sections 23–31, Locke examines the text of Genesis 1: 28 ('*God blessed them ... , be Fruitful and Multiply and Replenish the Earth and subdue it, and have Dominion over the Fish of the Sea, and over the Fowl of the Air, and over every living thing that moveth upon the Earth*'). Locke stresses that God gave Adam and every member of the human species a common, rather than exclusive, power over 'the Earth, and all inferior or irrational Creatures' (TT I. 23, 25, 29–31). This is a common right, or the 'right' which Adam had 'in common with all Mankind' (I. 24). Locke also criticizes Filmer's view of God's renewal of his original donation after the flood (I. 32–9), confirming that Noah and his sons were granted the common, rather than exclusive, right to the lower creatures (I. 32–9). Thus Locke concludes that Genesis, as well as other parts of the Bible, confirms 'the Original Community of all things amongst the Sons of Men' (I. 40).

Let us see how Locke did away with 'compact' or 'consent' as a normative basis for original appropriation, and how he created a new unilateralist theory.<sup>11</sup> In bringing about this change, Locke made five major theoretical adjustments. First, Locke appealed to the will of God in order to reject consent or compact as the normative basis. He says: 'If such a consent as that was necessary, Man had starved, notwithstanding the Plenty God had given him' (TT II. 28). It is important to understand Locke's strategy here. In his view, the law of nature or God the Law-Maker 'willeth the Peace and Preservation of all Mankind' (II. 7). God also wills every member of the human species to live for a while: it is 'his [God's] design' that 'Man should live and abide for some time upon the Face of the Earth' (I. 86). The right of self-preservation is ultimately grounded in this will or design of God. Locke's replacement of the will of God for 'consent' shows the great extent to which he is fighting a battle against arbitrary power. For Locke indicates that if another man's consent were required, he might exercise his power arbitrarily. It would be to suppose that God 'left one Man so to the Mercy of another, that he may starve him if he please' (I. 42). This is not what God has intended; rather, human beings are God's workmanship and his property, so that they have independent worth and are 'made to last during his, not one another's Pleasure' (II. 6). Grotius and Pufendorf as well as Hobbes made use of the device of compact or an agreement of wills, because they felt a need to explain how one man is obliged to abstain from another's property. They were concerned about the moral requirement that one's property imposes on another man, hence, about their 'moral qualities', or at least about the binding force involved. But Locke resorted to the will of God because he (p. 571) wanted to cut off men's mutual influence and remove any trace of human arbitrary power. A man's property in food was thus made independent of the will of any other human being; it became solely dependent on the supreme will of God.

Secondly, in order to create a unilateralist theory, Locke sought to locate '*the great Foundation of Property*' (TT II. 44) in each man himself. He did so by treating him as 'Master of himself, and *Proprietor of his own Person*, and the Actions or *Labour* of it' (II. 44). Locke claimed that 'every Man has a *Property* in his own *Person*', and that '[t]he *Labour* of his Body, and the *Work* of his Hands ... are properly his' (II. 27). This claim is what is known as the 'self-ownership' thesis.<sup>12</sup> In Locke's version, it means that every human being has an exclusive right of disposal (i.e. control) over his body, its powers, and modes. A seventeenth-century precursor who propounded the thesis was Richard Overton, though he did not specifically use it to explain the origin of a property in external goods (Overton 1998: 54ff.). Undoubtedly, Locke's version of the 'self-ownership' thesis is connected with the modern possessory notion of rights, according to which rights can be assimilated to the powers or portable possessions of an agent.<sup>13</sup> It goes beyond the scope of this chapter to reconstruct or evaluate Locke's justification of every man's property in his person.<sup>14</sup> Suffice it to say the following: Locke may justify every man's exclusive right to *use* his person, on the grounds that God wills to prohibit mutual harm among human beings (II. 6). But Locke would also need to appeal to God's goodness to allow human beings the greatest possible liberty, if he were to justify anything like a man's *property* in his person, i.e. his exclusive right of *disposal or control* over his person (which is, of course, limited by the will of God). A defence of self-ownership along these lines, whether ultimately successful or not, would constitute the second step in Locke's strategy of moving towards a unilateralist theory.

Thirdly, Locke resorted to a 'mixing' or 'joining' metaphor, in order to indicate the unilateral manner by which each man's

own thing (i.e. his labour-power or something like it) gets extended, and comes to be ‘joined’ to, and ‘fixed’ in, an external object. A man who has ‘mixed his *Labour* with’ it, and ‘joynd to it something that is his own’, ‘thereby makes it his *Property*’ (TT II. 27). This metaphor expresses what a labouring agent does to a part of the external world, and Locke goes on to add some remarks to unpack what is involved in this labouring process. Among others, he appeals to God’s injunction ‘subdue the Earth’ and the need to labour (II. 32); to the idea that labour involves pains and (p. 572) efforts, evoking the notion that labour should not be without its reward (II. 34); and to another idea that the property acquired by labour and industry brings about improvement, high productivity, or a great enhancement of values (II. 30–4, 37, 40–4). Issues relating to the particular significance of labour have been much discussed in the secondary literature.<sup>15</sup> But without further elaboration, we may also treat Locke as providing a unilateralist argument from the prior property right in a man’s person, or as offering a clumsy justification which could be replaced by the rule of ‘accession’ found in Roman law (as Hume pointed out in Hume 2007: 3.2.3 n72).

Fourthly, Locke added a new non-injury clause, i.e. the clause that prohibits any appropriator from injuring others. This aspect of his theory may require some comments since many commentators have failed to notice it.<sup>16</sup> Locke frequently appeals to the non-injury clause in Chapter V. He first states that appropriation by labour is legitimate ‘at least where there is enough, and as good left in common for others’ (TT II. 27). Many commentators have discussed the ‘enough and as good’ proviso, following Macpherson who wrote about ‘the sufficiency limitation’ (1962: 200–1, 211–14), or Nozick who talked about ‘the Lockean proviso’ (1974: 175–7). But Locke takes the avoidance of injury as a necessary condition for legitimate appropriation. In addition, he holds that if the ‘enough, and as good’ proviso is satisfied, it guarantees that injury to others will be avoided. In Chapter V, Locke takes it for granted that the non-injury clause is a norm to be kept, and stresses that the abundance of natural resources in the beginning of the world made the avoidance of injury possible. He says, ‘Nor was this *appropriation* of any parcel of *Land*, by improving it, any prejudice to any other Man, since there was still enough, and as good left; and more than the yet unprovided could use’ (II. 33). ‘No Body could think himself injur’d by the drinking of another Man, though he took a good Draught, who had a whole River of the same Water left him to quench his thirst’ (II. 33). The key words here are ‘injury’ and ‘prejudice’.<sup>17</sup> Locke repeatedly refers to the observance of the non-injury clause in the age of abundance (II. 36, 37), and he also touches on the avoidance of injury when he speaks of the later stage of exchange (II. 46), or the age of commerce when land becomes scarce within a region (II. 50).

I shall later argue that Locke did not think carefully about the judgement of injury, and failed to take the non-injury clause seriously. But it is important to see why he wanted to attach importance to it: Locke holds that the primary function of the law of nature, as well as positive laws, is to prohibit any injury to others. The fundamental precept of the law of nature prohibits mutual harm: ‘no one ought to (p. 573) harm another’ (TT II. 6). Locke uses ‘injury’ and ‘harm’ interchangeably.<sup>18</sup> All laws of political society are made to preserve the properties of its members, and this implies that they serve to prevent or correct any injury which may be done to them. Like J.S. Mill, Locke adopts the ‘harm principle’. In *Epistola de Tolerantia*, Locke discusses whether a sin is to be punished by the magistrate, and states in that context the general view that liberty can be legitimately taken away only when an act does harm to others (Locke 1968: 114–15). It is not surprising, therefore, that Locke tried to apply this principle to the case of free acts of appropriation, or free acts of mixing one’s labour.

‘Injury’ involves some infringement of another’s right, so we need to ask what specific rights are to be infringed when Locke speaks of an appropriator’s possible ‘injury’. First, an act violating any of the properties which all others already have in their own persons would obviously count as an injury. The same holds true of a violation of the properties which the others have already acquired in external goods. Secondly, any infringement of the right of self-preservation, possessed equally by everyone, would also count as an injury. Thirdly, a significant diminution of the ‘common right’ of everyone to take or use any part of God-given natural resources would count as an injury. Locke claims that each human being has ‘a right to a use of the Creatures’, or to ‘the use of those things, which were serviceable for his Subsistence’ (TT I. 86; also, II. 25). This common right of everyone appears in Locke’s theory as the common right of others, and prior acts of appropriation diminish a degree of their common right, i.e. their freedom to take or use any part of the natural resources. Locke describes the avoidance of injury as acting ‘without straitning [sic] any body’ (II. 36), i.e. without diminishing anyone’s freedom.<sup>19</sup> He generally stresses that the diminution is negligible, but if a significant degree of diminution occurred, it would count as an

injury. Locke appeals to the subjective sense of injury which others (i.e. potential victims) might have as a result of someone's appropriation: 'No Body could *think* himself injur'd by the drinking of another Man' (II. 33, emphasis added; also II. 36, line 22).

Finally, we come to the fifth theoretical adjustment that Locke made for his unilateralist theory. Locke offered a consequentialist justification of the injury-free unilateral appropriation. He explains how 'the *Property of labour* should be able to over-balance the Community of Land', and in so doing he stresses 'the Benefit mankind receives' from the well-cultivated tract of land (TT II. 43). He compares the high productivity of the enclosed land in England with the low productivity of the land which lies waste in America (II. 40–3). The standard of life in America, (p. 574) Locke famously states, is incomparably low: 'a King of a large and fruitful Territory there feeds, lodges, and is clad worse than a day Labourer in *England*' (II. 41). Locke even adds that an individual appropriator of land who increases agricultural products 'does not lessen but increase the common stock of mankind' (II. 37). The use of money enables appropriators to sell their agricultural products and 'to enlarge their *Possessions of Land*' (II. 48). This, in turn, contributes to greater economic prosperity, strengthening the consequentialist justification.

We have seen above how Locke transformed the earlier compact theories into a new unilateralist theory. I have omitted certain details of Locke's discussion, one of which should be mentioned here. Besides the non-injury clause, Locke did stipulate another 'non-spoilage and productive use' requirement, i.e. one can legitimately appropriate '[a]s much as ... one can make use of to any advantage of life before it spoils' (TT II. 31). This is a requirement or restriction, but it has a great deal to do with the encouragement Locke gives to a non-wasteful, productive use of natural resources. Thus the central message of Locke's unilateralist theory is unambiguous: People are free to mix their labour with natural resources to acquire a property in them, and they are free to exchange and expand their property by the use of money. This is a legitimate, unilateral mode of appropriation, which also brings about improvement and prosperity. Apart from the productive use of resources, the only caution people need to take is this: Do not injure others.

## 24.4 Locke on Appropriation and Dispossession

We now move on to consider the relationship of Locke's theory of appropriation to colonialism. The specific question we take up is this: How is it possible for his theory of appropriation to be a theory of dispossession as well? To answer it, I shall first criticize the currently influential, colonial reading. After rejecting it, I shall provide a more feasible account of the connections between Locke's theory of appropriation and the dispossession of Native Americans.

### 24.4.1 Locke on Appropriation and Dispossession: A Colonial Reading

In recent years, a number of scholars have provided a colonial reading of Locke's theory of appropriation. Given Locke's numerous references to America in Chapter V of the 'Second Treatise', and given his deep involvement with colonial (p. 575) affairs as administrator for a decade in his lifetime, it is both natural and fitting that his theory be located in the colonial context. But there has been an unfortunate tendency, among some scholars, to ascribe to Locke the type of argument which he did not actually deploy. As a result there now seems to be an overdrawn picture of Locke as the dispossessioner of Native Americans, which I believe ought to be corrected. I shall criticize one influential, colonial reading here. I take up James Tully's interpretation<sup>20</sup> because it has provided a great deal of ammunition for most of the succeeding colonial readings, including those provided by Barbara Arneil, Anthony Pagden, Duncan Ivison, and Nagamitsu Miura.<sup>21</sup> Tully claims that Locke used European concepts of politics and property 'to justify the dispossession of Amerindians of their political organizations and territories' (Tully 1993: 139). Here I shall leave aside Locke's theory of politics, and confine myself to the question how his theory of appropriation justifies the said dispossession.

Tully starts off by stressing that Locke draws from the premise that America is in the state of nature the conclusion that 'appropriation of land may take place without consent' (Tully 1993: 145). Tully actually leaves unexplained why America

being put in the state of nature counts as a reason for permitting appropriation to proceed without consent. Logically speaking, one could start with the state of nature, and go on to present a compact theory of the origin of property in the manner of Grotius or Pufendorf. But Tully is concerned to offer a narrative to show that there is a contingent, rather than logical, connection between America as a state of nature and the legitimacy of appropriation without consent. Tully's narrative is designed to show that early English settlers in America developed a particular type of 'agricultural' (or 'agriculturalist') argument, and that Locke gave a theoretically sophisticated version of it. The argument in question is a version of what is sometimes called 'the *res nullius* argument' (Pagden 1998: 42), i.e. the first occupancy argument. It runs as follows: (1) the lands that Native Americans have traditionally used for their own purposes can be regarded as 'vacant' places or *res nullius*, because their use is neither legitimate nor appropriate (i.e. because they are not engaged in sedentary agriculture, nor do they use their land productively or profitably); (2) any 'vacant' land or *res nullius* could be legitimately appropriated without consent by first takers or occupants, who are the new settlers who mix their labour with it through cultivation; and therefore, (3) it is perfectly legitimate for the settlers to 'dispossess' the Native Americans of their lands, those which they have traditionally used for the purposes of hunting, gathering, and non-sedentary agriculture. The key premise is (1), which miraculously converts the natives' lands (p. 576) into 'vacant' places. So Tully stresses its significance for the entire argument: '[T]he Amerindians neither occupied [nor] used in the appropriate manner the lands they claimed ... Hence, most of the land was vacant, ... and no consent [of the Amerindians] was required for its use' or its appropriation (Tully 1993: 148). Tully points out that while Roger Williams defended the Native Americans' rights to their lands, his opponents developed the 'agricultural' argument which proceeds from the key premise: 'only sedentary agriculture and improvement constitute the kind of use that gives rise to property rights, and, therefore, hunting and gathering lands may be looked on as vacant wasteland' (Tully 1993: 150). Tully's strategy is to quote from the writings of major proponents of the 'agricultural' argument such as John Cotton, John Winthrop, Francis Higginson, and Robert Cushman, and to show that there is a striking similarity between their views and Locke's.

There is no denying that Locke's defence of appropriation is similar to the early colonists' in certain respects. They often stressed God's injunction to subdue the earth; they regarded the cultivation of soil, or 'enclosure' or 'improvement', as the major method of appropriating a tract of land; and they wanted to see the Native Americans mostly as wandering hunter-gatherers who did not have fixed places of residence. Indeed, they can be treated as precursors of Locke who defended the legitimacy of unilateral appropriation. However, it is quite another thing to claim that the early colonial writers or Locke himself actually used the 'agricultural' argument of the kind Tully specifies. Actually, Tully is not successful in showing that the early colonial writers accepted the key premise (1) above. None of the passages he quotes from them directly shows that they have accepted the premise (Tully 1993: 150–1). In particular, Tully mixes his own comments with a quotation from Higginson's work, *New England's Plantation*, to make it appear as if Higginson himself had deployed the 'agricultural' argument.<sup>22</sup> But we shall leave this aside, since the central question is whether Locke, rather than the colonists, used the 'agricultural' argument in question.

Prior to Locke, various colonial writers spoke of America as 'empty', 'waste', and 'vacant' (Arneil 1996: 109–11). But we should ask what Locke meant by a 'vacant' place. Tully assumes that for Locke, the vacant lands in America *include* those lands which the Native Americans used for hunting and gathering. He stresses that 'all land that is not actively under cultivation is said to be vacant' (Tully 1993: 146). However, what Locke says about vacant places in America does not fit this description. He says: 'let him [i.e. a man] plant in some in-land, vacant places of *America*, we shall find that the *Possessions* he could make himself upon the *measures* we have (p. 577) given [i.e. the measures of '*Mens Labour, and the Conveniency of Life*'] would not be very large, nor, even to this day, prejudice the rest of Mankind' (TT II. 36). Here Locke clearly has in mind the sparsely populated areas of America, where land is abundantly available, and where (even at the time when mankind has spread all over the world) one man's appropriation cannot possibly injure any other. In other words, the 'vacant' places are those tracts of land which *exceed* the ones that the local dwellers inhabit and use. This is confirmed by what Locke says immediately afterwards: 'there are still *great Tracts of Ground* to be found, which ... *lie waste*, and are more than the People, who dwell on it, do, or can make use of, and so still lie in common' (II. 45: lines 19–23). Clearly, Locke is *not* suggesting that the territories which the Native Americans inhabit and use are part of the great

tracts of uncultivated land. Rather, he is acknowledging that there are *more* tracts of land *than* what the dwellers (i.e. the Native Americans) ‘do, or can make use of’.

It is also implausible to treat Locke as holding the view that sedentary agriculture is the *only* legitimate use of land. It is tempting to do so because he claims that cultivation, rather than hunting and gathering, gives rise to property rights in land. But Locke referred to the Indians’ hunting and gathering activities in Chapter V (TT II. 26, 28), and he clearly knew that they needed and used land for their activities. It is difficult to imagine that Locke took their use of land as illegitimate, though he obviously thought that the use of land for sedentary agriculture is much more productive and commendable. If an Indian can legitimately kill a deer for the purpose of his self-preservation, then it follows that he can legitimately use a certain tract of land for that purpose. Thus it is safe to infer that the use of land for hunting and gathering purposes, in Locke’s view, is an example of legitimate use. This is an implication of his view. Habitation may be another example of legitimate use. There is yet another example he offers. In referring to a biblical history in Genesis, Locke actually says: ‘*Cain* might take as much Ground as he could till, and make it his own Land, and yet leave enough to *Abel*’s Sheep to feed on’ (II. 38). Abel does not cultivate land, but only *uses* a portion of land *for keeping sheep*. Cain is obliged to leave enough for Abel, and Abel’s use of land is certainly as legitimate as Cain’s cultivation. Similarly, Locke can argue that the Native Americans can legitimately use land for hunting and gathering purposes, while English settlers are obliged to leave enough land for them. Of course, Locke did not explicitly state his position on this issue. But this interpretation is consistent with the non-injury clause, and there is nothing in Locke’s text that makes the natives’ use of land illegitimate.

Tully brings in other considerations to show that Locke deployed the ‘agricultural’ argument. He discusses Locke’s view that the Native Americans did not use their lands productively or profitably (Tully 1993: 155–6, 160–2). This view is exhibited in his comparison of the enclosed land in England with the American wasteland. Nevertheless, Locke clearly did not use the comparison to conclude that the Native Americans’ lands were ‘vacant’. Again, Tully notes that some English (p. 578) settlers sought to justify expropriating the agricultural lands of coastal Indians by taking their ecologically benign way of soil enrichment as lacking a proper method of cultivation, or as a sign of laziness. Tully says that Robert Cushman attempted such a justification, and he goes on to claim that Locke ‘elevates [it] to the status of a law of nature’ (Tully 1993: 157). Locke, as Tully points out, stated that ‘[i]f either the Grass of his Inclosure rotted on the Ground, or the Fruit of his planting perished without gathering’, ‘this part of the Earth, notwithstanding his Inclosure, was still to be looked on as Waste, and might be the Possession of any other’ (TT II. 38). But it is difficult to see this statement as offering a justification of expropriation of the kind Tully discusses. Locke is explaining how the ‘non-spoilage and productive use’ requirement should be interpreted in relation to the land appropriated by labour. Clearly, his statement is directed *against those who have already enclosed* a tract of land. It is not directed against the Native Americans, since on Locke’s own assumption they know ‘no Inclosure’ and remain ‘Tenant[s] in common’ (II. 26).<sup>23</sup>

Thus we can conclude that Locke did not deploy the ‘agricultural’ argument which Tully attributes to him. It is easy to understand why Locke did not do so. Since his theory begins with the assumption of the God-given original community of things, and since the community in question is a ‘negative’ one where things do not belong exclusively to any particular human being, those things have no owner from the beginning. So Locke’s theory needs *no extra argument* to establish the *res nullius* premise. We should reject Tully’s interpretation as untenable,<sup>24</sup> and try to look for a better account of the linkage between Locke’s theory and the Native Americans.

#### **24.4.2 Locke on Appropriation and Dispossession: A Liberal/Colonial Reading**

Let us begin by reminding ourselves that Locke’s theory of appropriation exhibits certain ‘liberal’<sup>25</sup> features. It is predominantly a liberal one in the economic sense. What Locke eventually justifies is the kind of property distribution which arises (p. 579) from the economic activities of free acquisition and exchange. Of course, there is a proviso that those activities must not involve any injury to others. But Locke’s unilateralism has gotten rid of the consent of others and puts this non-injury clause in its place, and stresses that the free economic activities bring about improvement and prosperity.



Locke's unilateralist theory of appropriation is also liberal in that it is linked to his theory of limited government. A comparison with Hobbes is helpful here. Hobbes' (indirect) compact theory protects each man's property only against the violence of his neighbours, while leaving it unprotected against the power of a sovereign. This is because it makes property dependent on the sovereign. In fact, Hobbes rejects any property theory that '*excludeth the right of the sovereign*'. He calls it a 'doctrine, that tendeth to the dissolution of a commonwealth' (Hobbes 1998: 29.10). For Hobbes, Locke's theory would count as such a dangerous doctrine. By contrast, Locke holds that a theory of the Hobbesian type leaves no property at all, since the sovereign can take it away 'when he pleases, against my consent', i.e. '*arbitrarily*' (TT II. 138; also 139–40). From Locke's viewpoint, his own theory of appropriation is the basis upon which the superstructure of limited government stands. It is the basis in the sense that it specifies what type of property rights ought to be protected by the superstructure. Locke's theory of appropriation is linked, through the purpose of establishing a commonwealth and government (II. 123), to a set of claims about the limits of the supreme power of a commonwealth. Among them is the claim that the supreme or legislative power cannot be exercised arbitrarily. Those who hold the supreme power ought to '*dispense Justice, and decide the Rights of the Subject by promulgated standing Laws, and known Authoris'd Judges*' (TT II. 136). This impartial protection of the subjects' properties (i.e. their lives, liberties, and possessions) is one of the limits or obligations Locke placed on the supreme power. Another limit concerns the power of taxation: those who hold the supreme power cannot levy tax on the people without their own consent (II. 140). These and other limits presuppose that their property in external goods arises in the legitimate way, as specified by Locke's theory of appropriation.

But we need to go beyond the recognition of these liberal features if we want to clarify the connections between Locke's unilateralist theory of appropriation and the problem of colonialism or dispossession. For this purpose, we should realize that a few significant connecting links exist between his theory and the administration of the colony of Carolina which he was deeply involved with. David Armitage has persuasively argued that Locke probably composed Chapter V independently of the rest of the 'Second Treatise', in the summer of 1682 when he was also revising the draft for the *Fundamental Constitutions of Carolina* (Armitage 2004: 615–17). Locke's numerous references to America in Chapter V attest to this chronological link. What substantive connections are there between Locke's own theory and the administrative policy of Carolina? There are at least three such connections. First, while Locke's theory justifies the original acquisition of landed (p. 580) property by the method of agricultural cultivation, this method is precisely the one which, in the opinion of Shaftesbury and himself, ought to be adopted by the English settlers in Carolina. Shaftesbury and Locke, as Barbara Arneil has shown, were deeply committed to adopting what they took to be the peaceful, English method of cultivation and settlement, while also trying to avoid the violent, Spanish method of conquest and the search for precious metal (Arneil 1996: 120ff.).<sup>26</sup> Secondly, the Lords Proprietors including Shaftesbury stressed, as Locke does in his theory, that appropriators should not take more land than they could cultivate and use (Arneil 1996: 123). Thirdly, just as Locke was concerned about the avoidance of injury in his theory of appropriation, the Lords Proprietors considered it very important to avoid mutual injury and establish peace in their dealings with the Native Americans, as well as among the English settlers (Arneil 1996: 125–7).

With respect to the third connection above, we should draw attention to the largely neglected draft of a set of agrarian laws (1672), written after the first draft (1669) of the *Fundamental Constitutions of Carolina*. It was entitled by a later historian 'Agrarian Laws or Instructions from the Lords Proprietors to the Governor and Council of Carolina, 21 June 1672'.<sup>27</sup> Article 18 of the 'Agrarian Laws' shows one concrete way in which the Native Americans in Carolina are accommodated within the colony. This article stipulates the following: 'That Square of twelve thousand acres wherein any Indian Towne stands, and the next Square to it are to be left untaken up and unplanted on for the use of the Indians' (Rivers 1856: 358). This prohibits the English settlers from planting in their land within a square of twelve thousand acres surrounding any Amerindian town, and another adjacent square of the same size. The two squares to be protected may be seen as a kind of proto-reservation. As such, it may look much less attractive than the original state of Amerindian liberty. But what this article reveals is that the idea of peaceful cohabitation, or that of injury-free appropriation, was actually proposed in the colonial circle with which Locke was very closely associated. There is no evidence that Locke himself endorsed that idea. But the fact that the idea was proposed indicates that the unilateralist interpretation, incorporating the non-injury (p. 581) clause as it does, reflects part of the historical reality of the colony of Carolina, rather than being a mere anachronistic

construct.

Having seen the liberal and colonial features of Locke's theory, we are now in a position to see how it can justify dispossession. What we should do is to represent the relationship of labouring appropriators to the other commoners, *as that of English settlers to the Native Americans*. Then his theory prescribes one method of appropriation for the English settlers: they may legitimately appropriate the land in America by their labour (and can later expand their landed property by the use of money), *provided that they could avoid injuring the Native Americans*. This is a colonial variant of Locke's theory of appropriation. Whether dispossession of the natives will take place or not depends on how strictly the non-injury clause is observed. As long as Locke takes the non-injury clause seriously, and makes it fully operative, the Native Americans are well accommodated in his theory. But if Locke fails to take it seriously for one reason or another, then his theory excludes the Native American from its domain, and justifies dispossessing them of their lands.

Let me elaborate this general account by providing some details. First, consider the situation of abundance that obtains in the beginning of the world. The abundance of land allows English settlers to appropriate portions of American land by their labour, while it seemingly secures the Native Americans' continuous use of their territories. We should also remind ourselves that Locke acknowledges and respects the natives' right to self-preservation when he speaks of '[t]he Fruit, or Venison, which nourishes the wild *Indian[s]*' (TT II. 26; see also sect. 28). Locke's theory, at least at this stage, seems to secure the condition for the avoidance of injury. The abundance of land seems to allow the appropriators to avoid injuring the natives, even in the third sense of injury as a significant diminution of their freedom. So Locke's theory of appropriation seems to be compatible with the lifestyle and freedom of the Native Americans.

However, we should note that even in this state of abundance, Locke's unilateralist theory allows injuries to occur. For it allows English settlers to make *wrong* or *arbitrary* judgements about what part of America is really 'vacant', or what part is being actually used by the natives. Locke assumes that judgements of injury are made unilaterally, i.e. made by the settlers alone, or without consulting with the Native Americans. The settlers may be quite ignorant of the natives' traditional, free use of an extensive tract of land. Or they may deliberately make false claims about the 'vacant' land. Since Locke's theory relies on unilateral judgements about injury, it can endorse wrong or arbitrary judgements. If this happens, the natives can be injured, and they can be dispossessed of the lands they have used freely.

This problem about the judgements of injury persists through the state of nature, and it gets worse at the later monetary stage of economy with its population growth and its regional scarcity of land. We can imagine that a native tribe traditionally used an extensive territory, while a group of settlers have recently come over to the neighbouring area, and have started cultivating a tract of land. (p. 582) Later, they may want to expand it for commercial agriculture. Then the settlers may demand the natives to give up or sell part of their traditional hunting and gathering grounds. A conflict may begin to develop. In this situation, the settlers can no longer rely on their unilateral judgements. Rather, they need to make use of an intersubjective device—peaceful talks, precedents, agreements, or treaties—to establish certain shared judgements, and to avoid disputes between themselves and the Native Americans. The state of nature lacks such a device for the correction of judgements, and this remains a constant source of injury and dispossession.

Besides the problem about the judgements of injury, there are some other inadequacies of Locke's account of injury. One inadequacy concerns the absence of an effective, peaceful means of protection. From the viewpoint of the Native Americans, it is not sufficient that the English settlers understand their traditional land use and see it as a legitimate one. The natives need not only the recognition of legitimacy, but also the effective protection which guarantees their land use. Such an effective protection should be offered by the intersubjective devices mentioned above, but this protection is not available in Locke's state of nature. The lack of it remains a source of dispossession.

There is another inadequacy which pertains to Locke's concept of injury. At one point he operates on an obscure notion of injury, and confuses injury with waste. He links the notion of injury to something's perishing uselessly. Locke says that if something (e.g. fish) 'perished uselessly [sic] in his [someone's] hands', he did 'injury' to others, while if nothing perished uselessly, he did no injury (TT II. 46). But wasting fish does not injure other human beings, as long as there is plenty of fish.



This confusion is linked to the defence of another view, namely that unlike hoarding perishable food, ‘heap[ing] up’ money cannot injure others (II. 46, 50). Once we are freed from the confusion, however, we are able to see that money enables the enlargement of landed property, which may significantly diminish the freedom of others (i.e. injure them).<sup>28</sup>

From these considerations, we must conclude that Locke did not take the non-injury clause seriously. He failed to do so, though he concentrated on the original state of abundance and the prosperous state of commercial agriculture, and thereby created the impression that an injury could not be done to others. A possibility of dispossession remains with his theory, as long as the non-injury clause is neglected. Some might feel that this is not an effective criticism of Locke’s position. They might object that Locke was clearly aware of the partiality of the judgements that human beings make in the state of nature. In fact, he proposed the establishment of a political society to remedy that defect. Nevertheless, Locke’s neglect of the non- (p. 583) injury clause in dealing with the Native Americans cannot be rectified even when a political society is established. In the first place, the Native Americans’ society is not a ‘political society’ in the full sense of the word (TT II. 108). But more importantly, its relationship to a ‘political society’ remains a natural one. They mutually remain in the state of nature, as they lack a common authority for adjudication. Each political society can correct injuries within itself by its positive laws and judges. But there is no peaceful method of judging, avoiding, or correcting the injuries that arise from the mutual interactions of political societies, or those between a society of Native Americans and a political society.<sup>29</sup>

## 24.5 Concluding Remarks

In this chapter we have seen how a unilateralist theory of appropriation like Locke’s was proposed as an alternative to the earlier compact theories, and how it can possibly serve liberal purposes in England and colonial purposes in America. Locke’s theory of appropriation, as a liberal/colonial theory, may be taken to represent a striking combination of the virtues and vices of the modern world. There is a temptation to seize upon either the virtues or the vices in a one-sided fashion. I have tried to avoid it, and have focused on the kind of uneasy alliance which holds between the legitimacy of appropriation and the avoidance of injury. Despite the great importance he attached to the notion of the avoidance of injury, it is now clear that Locke’s theory does not really respect the injury-free distribution of property. Any unilateral judgement of injury can be wrong or arbitrary. If the particular judgement enshrined in article 18 of the ‘Agrarian Laws’ about accommodating the Native Americans is a unilateral one rather than the product of a fair agreement, then this judgement must also be regarded as potentially wrong or arbitrary.

I should like to end by noting that the emergence of Locke’s unilateralism does not mark the end of the conventionalist theory of property. After Locke, Hume undertook to transform the old conventionalism of Grotius, Hobbes, and Pufendorf into a new, refined conventionalist theory of property in Book 3 of the *Treatise of Human Nature* (1740). Hume used ‘convention’ in the new sense of a convergence of the senses of interest of the parties concerned, rather than in the old sense of an agreement of wills. Hume’s conventionalist theory even paved the way for (p. 584) Bentham’s general normative theory of utilitarianism (Bentham 1988: 51, note v1). On the other hand, Gershom Carmichael<sup>30</sup> and Jean Barbeyrac<sup>31</sup> approved of Locke’s unilateralist theory at the beginning of the eighteenth century; and Hutcheson adopted and modified it into a new unilateralist, labour theory of property, which might be described as functionalist and humanitarian.<sup>32</sup> Thus debates went on, and new theories continued to be presented in the eighteenth century. Yet the unilateralist change wrought by Locke was radical, indeed. Given the combination of its liberal and colonial features, his theory is more problematic than anything we see in the following centuries.<sup>33</sup>

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## Notes:

- (1) Ittersum 2006 and Grotius 2004: xi–xx.
- (2) Selden’s *Mare Clausum* (1635) is a rebuttal of Grotius’ claim about free access to the ocean in *Mare Liberum* (1609), but it subscribes to the compact theory Grotius presented in *De jure belli ac pacis* (1625). See Selden 2004: 23.
- (3) Filmer, ‘Observations concerning the Originall of Government, upon Mr Hobs *Leviathan*, Mr Milton against *Salmanasius*, H. Grotius *De Jure Belli*’ (originally published in 1652 and 1679), in Filmer 1991.
- (4) TLN: 666, ix, xiv.
- (5) Tyrrell 1681: 98–116 (second pagination, to be corrected as 138–56).
- (6) All English translations are from Grotius 2005. The Latin text used is Grotius 1995.
- (7) Grotius himself does not offer a definition of ‘perfect’ rights, but a brief definition offered here can be inferred from his account of just war in *De jure belli ac pacis* 1.2 and what he says about the connections between punishment and the violation of perfect rights in the same work, 2.20. See also Barbeyrac’s note 21 to Grotius 2005: 1.1.4; Pufendorf, *De jure naturae et gentium* 1.7.7, and 3.1.3.
- (8) For the Epicurean position of justice as such, see ‘Principal Doctrines’ XXXI, XXXIII, XXXIV, XXXV, XVII, in Inwood and Gerson 1994; ‘Satires’ I. iii. line 98 in Horace 1991; and Bernier 1699.
- (9) Ulpian also takes the two words to be synonymous, and defines ‘conventio’ as the coming together of ‘different motions of the mind’ so as to form one opinion; Mommsen and Krueger 1985: 2.14.3.
- (10) See Filmer’s ‘Observations’ in Filmer 1991: 208–34, especially 234.
- (11) Locke’s shift to the new unilateralist theory is likely to have taken place sometime after 1677 or 1678. An undated manuscript piece, entitled ‘Morality’ (Bodleian Library MS Locke c. 28, fols 139–40), contains a sketch of the Hobbesian compact theory of rights or what is one’s own. ‘Morality’ was first published by Thomas Sargentich in Locke 1974: 26–8, and later reprinted in Locke 1997: 267–9. The dating of 1677 or 1678 offered here follows Goldie’s in Locke 1997: 267.
- (12) The popularity of the label ‘self-ownership’ is due to G.A. Cohen’s work on Nozick, Locke, and Marx; see Cohen 1995.
- (13) For the connections between Locke’s concept and the modern possessory notion of rights (or what is loosely called ‘subjective rights’), see Shimokawa 2006, especially 183–94.
- (14) For a reconstruction and critical evaluation, see Shimokawa 2000: 153–65. For Locke’s concept, rather than his justification, of ‘a property in his own person’ see Shimokawa 2000: 93–8, 102–5; and Shimokawa 2006: 196–201, 204–6.
- (15) See among others, Simmons 1992: ch. 5 and Shimokawa 2000: ch. 3.
- (16) One notable exception is Karl Olivecrona. See his classical articles, Olivecrona 1974a: 227 and 1974b: 228–9.
- (17) The word ‘prejudice’ means ‘injury, detriment, or damage, caused to a person by judgement or action in which his rights are disregarded’ (OED ‘prejudice’, 1.1.a).
- (18) See TT II. 10, 20, 93, 181. Pufendorf expanded the meaning of the Latin term *damnum* (damage) so as to refer to any sort of injury, including the injury done to a human body, reputation, or chastity [*pudicitia*] (*De Jure Naturae et Gentium* 3.1.3). In this Locke seems to follow in the footsteps of Pufendorf. For Locke’s use of *damnum*, see Locke 1968: 94, 110, 124.
- (19) The word ‘straiten’ means to ‘narrow or restrict the freedom, power, or privileges (of a person)’. See OED ‘straiten’,

5.

(20) Tully, 'Rediscovering America: the *Two treatises* and aboriginal rights', in Tully 1993: 137–76.

(21) For Tully's extensive influence on other scholars, see Pagden 1995: 77–8; Arneil 1996: 7–8, 75ff., 107ff., 141ff.; Pagden 1998: 42–8, and 42 n34; Ivison 2003: 89–93; and Miura 2009: 67–8, 56–9. My critique is directed against Tully's interpretation, and the particular line of interpretation that the other scholars have inherited from him. They have added new considerations, some of which I take to be important and valid. See, for instance, my remarks on Arneil below.

(22) In Tully 1993: 150, last paragraph, Tully mixes his own remarks about the basis of property, including the Latin sentence *Vacuum Domicilium cedit occupanti*, with Higginson's description of the life of Indians. The latter description is found in Higginson 1680: 12, seventh paragraph. Tully's additions are highly misleading, and amount to a misrepresentation of Higginson's view.

(23) It should be added that in TT II. 37, Locke did consider the waste or spoilage of 'the Fruits' and 'the Venison'. There he had in mind the Native Americans as well as the English settlers.

(24) It is worth noting that Tully derived his interpretation from a politically charged polemic, rather than a sober analysis of Locke's own text. He obtained a significant clue from John Bulkley, a Connecticut clergyman who used Locke's theory of politics and property in order to deny the Mohegans any right to their traditional hunting grounds. Bulkley wrote his polemic, and published it in Bulkley 1725. Tully acknowledges that he derived his interpretation of Locke from Bulkley (Tully 1993: 166). He used it *against* Locke, and argued that Locke deployed the 'agricultural' argument for the dispossession of the Native Americans.

(25) I use the word 'liberal' as a term of art, in the hope that it will serve as a conceptual shorthand. For the purpose of our discussion, we should take it to imply that liberty, economic and otherwise, is defensible within the limits of non-injury, that the power of government should be limited, and that it should primarily be exercised so as to provide the impartial, legal protection of that liberty.

(26) This important point still needs emphasizing. Some scholars have tried to link Locke's account of the right of punishment, or the right of war, or conquest in the 'Second Treatise' to the justification of the dispossession of Native Americans (e.g. Miura 2009: 153–61, 168–75; Tully 1993: 155). But given Locke's stress on the peaceful method of appropriation, it is difficult to establish such a link. Space does not permit me to discuss this issue. Suffice it to say that Locke explicitly denied a lawful conqueror the power of dispossession, i.e. the 'Power, to dispossess the Posterity of the Vanquished, and turn them out of their Inheritance, which ought to be the Possession of them and their Descendants to all Generations' (TT II. 184).

(27) A transcription of the draft is found in Rivers 1856: 355–9. The original draft, preserved in the National Archives (TNA CO 5/286, fols 44<sup>v</sup>?46<sup>r</sup>.), is untitled. It is not in Locke's hand. But attached to it were the signatures of Craven, Shaftesbury, H. Cornbury, G. Carteret, Jo. Berkeley, and P. Colleton, with their official seals in red wax.

(28) One may also point out that the liberty-centred notion of injury which Locke adopts has a cultural bias. It seems plausible to suggest that one's sense of injury is dependent upon what one actually considers important, e.g. the sense of being one with nature, and not necessarily the sense of liberty.

(29) What Locke calls 'an appeal to heaven' is a method of correcting injuries. This appeal to God's tribunal involves an attempt to redress injuries, on a victim's conscientious judgement, by resorting to arms here on the earth. For an explication of this idea, see Shimokawa 2003: 76–81. But since this obviously involves violence, it is not a peaceful method we are considering in this context.

(30) See Carmichael 2002: 94–6.

(31) See Barbeyrac's notes to Pufendorf 1729: 4.4.4 n4; also 4.4.5 n1, 4.4.5 n7, 4.4.6 n1.

(32) See Hutcheson 2008: 186–7, for the stress he puts on the function of labour in production; also Hutcheson 2007: 137–42, for the labour theory which appeals to the sense of humanity and equity. For an account of Hutcheson's version of unilateralism, as well as Barbeyrac's and Carmichael's, see Shimokawa 2012: 1–25.

(33) I am very grateful to David Armitage, Conal Condren, and Thomas Mautner for having offered many valuable comments on earlier versions of this chapter. David Armitage kindly suggested to me that I proceed cautiously in handling article 18 of the 'Agrarian Laws' of 1672. I am also thankful to Peter Anstey for making a number of editorial suggestions.

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## Sovereignty

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## Abstract and Keywords

This chapter, which examines the conception of sovereignty in Great Britain during the seventeenth century, explains that the terms sovereign and sovereignty were used before the seventeenth century to mean rule, majesty, and power. It highlights the influence of French philosopher Jean Bodin's *Six livres de la République* on the development of the theory of sovereignty in Britain, and also considers the relevant works of Thomas Hobbes and John Locke.

Keywords: sovereignty, Great Britain, Jean Bodin, Six livres, Thomas Hobbes, John Locke

IN political philosophy sovereignty is usually taken either as a natural kind of the political, or as a defining feature of modernity (Prokhovnik 2007: 1–32). The first understanding, as Prokhovnik argues, is historiographically reductive; the second has typically suggested a trajectory from a medieval world of personal obligations to one of allegiance to an abstract identity, the sovereign state (Prokhovnik 2008: 13–25).

Reliance on either proposition to read seventeenth-century argument is akin to seeing early modern philosophy through a later disciplinary lens; each exemplifies the way in which a modern conception of a distinct political domain is imposed upon a period in which the very notion of the political was fugitive and conceptually diverse (Condren, Gaukroger, and Hunter 2006; Condren 2006: 109–229). The main subfields of study for which sovereignty is central, political economy and international relations, did not exist. Indeed, a concept of sovereignty might be rejected as dangerous and unnecessary, or its use might be either casual or imprecisely wide-ranging, present in theology, ecclesiology, and jurisprudence, in physiology, language theory, and in discussions of the soul.

Such a diversity of employment complicates any account of philosophical arguments over sovereignty. In England, these were relatively sporadic, perhaps because the university culture that provided the principal institutionalized environment for philosophy was less important there than, for example, in Scotland. Additionally, Europe's numerous universities were to some extent functionaries in dynastic policies of state building, whereas in England, the formation of a state was more ad hoc and so a role for universities to service it, less certain (Hunter 2006: 35–65; Braddick 2000). Moreover, even when seen as a discipline, what (p. 588) mattered about philosophy were its practical consequences. In a weak sense, the pragmatist notion that the meaning of a concept lies in the range of its implications is illuminating, if implication extends to perceived possibilities for social conduct. So the philosophical leads, often briskly, to what we would see as the non-philosophical, sovereignty itself to a whole complex set of socio-political conceptions.

The words 'sovereign' and 'sovereignty' were in use in England before the seventeenth century, during which they became associated with a fluid vocabulary of often synonymous expressions, 'rule', 'majesty' (from *maiestas*), and 'power'. The

meanings of these terms must be located principally within a moral domain broadly specifying relationships of office. In so far as we no longer inhabit a world shaped by such a perspective, there is a discontinuity between modern and early modern conceptions of sovereignty. This ethical context first needs outlining.

Moral, social, and intellectual being was generally identified in terms of limited *officia*. Beyond corporeal existence, human identity was what may be called nominal; one acted as a *persona*, say mother, mayor, even philosopher, in relationships of responsibility to others. A given realm of duty specified with reference to its ends, furnished rights and liberties necessary for such purposes and it was presupposed that to exercise office required relevant aptitudes, skills, and virtues. Reciprocal rights and duties were accorded to those under the aegis of the office, such as children and parents. The world of *officia* comprised complementary vocabularies of legitimation, through which those in office were commended or criticized. In extremity, a *persona*'s sanctioning moral identity might be denied, an office-holder transformed into a tyrant. Sovereignty, in fact, was pictured as a paradigmatic office, and occupying sovereigns were *personae* often subject to such damning re-description (Condren 2006: 15–35, 80–104).

Prior to the seventeenth century, conceptions that look much like sovereignty independently of the word and its cognates were similarly specifications of office. Several of these need noting as they informed seventeenth-century argument. The Roman Law notion of *imperium*, initially an office of military command, was extended to look much like a claim on sovereign authority, though the Romans had usually been careful to distinguish *imperium* from the *auctoritas* that would be central to sovereignty (Armitage 2000; Adcock 1959).

In the thirteenth century, the papacy claimed *plenitudo potestatis*, unrestricted power derived from a moral right exercised in the interests of peace and salvation. This hierocratic understanding of the church was particularly vital during times of institutional uncertainty, providing a continuity of authority, from Christ and St Peter, irrespective of the individuals occupying office (Wilks 1963: 411–23). Crucially, there was an easy flow of vocabulary between *sacerdotium* (church) and *regnum* (polity) and the need for expressions of divine ordination was no less important to secular rulers. Ernst Kantorowicz's exploration of the king's two bodies, one mortal, one official, amasses the evidence to show wide familiarity with (p. 589) a conceptual continuity defining the office (Kantorowicz 1957). The evidence contradicts any simple trajectory from personal loyalties to a reified object of allegiance. Be this as it may, in the fourteenth century, hierocratic doctrines were countered by the equally extreme arguments of Marsilius of Padua. The papacy, he insisted, was the greatest threat to the peace of Christendom, having usurped the authority that rightly belonged in any community to the citizen body (*legislator humanus*) or its representative, the weightier part (*valentior pars*), with the governing part (*pars principans*) acting as an executive (Marsilius 1958 [1324]: 1.12). These abstract relationships were, he held, manifested variably according to custom but were also mirrored in ecclesiology, with the church (*ecclesia*) being not the priesthood but the *legislator humanus* in its pious capacity. The stark contrasts between Marsilius and hierocratic theologians on the nature of papal authority have since been used to create a misleading ideological model of seventeenth-century sovereignty theory, with a descending, divine right sovereignty from God, opposed to an ascending one from the people (Sommerville 1986; 1991: 347–73; Ullmann 1975; cf. Oakley 1973: 1–48).

Finally, it is important to note Bodin's seminal work and the genre of *politica* writing to which it gave rise. During the first half of the seventeenth century, nearly every European university would produce at least one *politica* treatise, offering a theory of sovereignty in the interests of peace and consolidation (von Friedeburg 2002: 101–5). The fashion came late to England.

Bodin's *Les Six livres* was written in French and Latin and translated into English by Richard Knolles. It has a direct place in English theory (Bodin 1576, 1586, 1962 [1606]). Expressed at a high level of sophistication, it also brought together a mass of illustration, becoming a resource for, as well as a stimulus to, debate. Bodin's delineation of sovereignty was designed to help restore peace to France (Franklin 1991; Prokhovnik 2008: 34–53; Salmon 2007: 467–78). He argued that every society needed to recognize a unitary principle of sovereignty at its core. The sovereign, irrespective of governmental form (republic or monarchy) or mechanisms of origination (election or inheritance), occupied an office, the purpose of which was to

maintain peace and justice in society under God's laws. For this end, the office comprised a range of *marques* or *iura*, offering a synoptic description of a political society. These were the liberties of the sovereign, amounting to a monopoly over a set of entailed duties: to legislate, to declare war and make peace, impose taxes, issue currency, control weights and measures, and impose and release from oaths. Distributed, they created the social disaster of a mixed constitution, prone to warfare and disintegration; together they made any sovereign absolute, a locus of ultimate authority. On medieval precedent, then, sovereignty was an abstract principle of continuity cohering a people in a governable territory, a *république*; or, as Knolles translates, a 'commonweale'. There was an equally firm negative implication for those governed; by definition they were subjects, a status entailing an unqualified duty of obedience. Any invasion of the sovereign's office was (p. 590) tyranny, and tyrants might be dispatched without trial—a point that Milton would reiterate to a very different end. Bodin did his best to insulate rightful sovereigns from accusations of tyranny, but as we will see, because the identity of an office-holder was predominantly a function of appropriate conduct, the sovereign *persona* would prove linguistically insecure.

Bodin's work entered an English environment uncongenial to sovereignty theory where the image of Knolles 'commonweale' was typically of its offices being distributed. A sovereign ruled in the context of a high level of independent responsibility and involvement throughout the country; and the office of counsel to the monarch was close to being conceived as participation in rule (Goslicius 1593 [1568]). If we assume, a priori, the centrality of sovereignty, from a Bodinian perspective, it seems philosophically confused. For some writers, this may have sometimes been so (Merbury 1581); but it is nearer the mark to say that the predominant vision offered ways of obviating or diminishing the need for a concept of sovereignty (Aylmer 1559; Smith 1906 [1583]; Burgess 2007: 336–54).

There were jurisprudential and confessional reasons for this. Common to Bodin and the antecedent theories noted above, was a conception of Roman law with codification and legislation at its centre. This made theories of sovereignty strongly juridical. In England they entered a legal culture that elevated the customary to the status of authoritative social reason needing interpretation by common lawyers (Pocock 1957; Burgess 1992: 19–78; Cromartie 2006: 80–114). Properly used, common law might function instead of sovereignty, discovery doing much of the work of legislation, with the rationality of the law itself framing and, through its officiating judges, standing as a bulwark against the excesses of rulers and ruled alike. From such a perspective, sovereignty theory was alien, jurisprudentially Roman and worse, in a Protestant society, could be deemed denominationally Roman too. Any contest between sovereignty-based and non-sovereignty-based accounts of the polity was immediately personalized with the accession of James VI & I in 1603.

He came down from Roman law Scotland armed with a forthright quasi-Bodinian conception of his office (Cromartie 2006: 150–4). He had taken the armoury of papal *plenitudo potestatis* as a defence against the views of his tutor George Buchanan, which in turn, if not derived directly from, linguistically echoed the anti-papal arguments of Marsilius. Buchanan, a firm believer in the physic of tyrannicide, had stressed the limitations of rule and a residual right of the ruled to act should the monarch cease in that *persona* and become a tyrant (Buchanan 1579; 1725: I). James, whose family was prone to violent death, and whose mother had been deposed, responded uncompromisingly (James VI & I 1598, 1616: 191–210). Tyranny, he accepted, was wicked, and his office was constrained by its ends to rule for justice and peace. But all earthly restrictions on him were moral; free monarchs (not all were so absolute) were answerable exclusively and directly to God. They were makers and judges of the law, hence a major part of their duty lay in the (p. 591) prerogative, the liberty of office to change or dispense with anything they had legislated (James VI & I 1616: 200, 206, 203). James' image of his *persona*, was as close to a Scotan voluntaristic god on earth as the *teleoi* of his office would allow. The implication for his subjects was strictly Bodinian: the word subject (*subditos*) entailed obedience in a relationship of sovereign office. It was simultaneously a jurisprudential and an ethical assertion. As Henning Arnisaeus would elegantly universalize the matter, by definition a polity is an order of subjection (Arnisaeus 1615: 2. 1).

James' understanding of sovereignty preceded him into England and with its essence in prerogative, was treated with suspicion. Effectively, the problem of sovereignty spread from the nature of rule to one of threatened cultural and legal identity. The English resisted the closer union between his domains that James wanted, some fearing that any label of 'Great Britain' would expunge Englishness (Anon., c. 1605; Jack 2001: 75–102; Richards 2001: 103–21). The ramifications of a

concept of sovereignty reached well beyond any philosophical articulation into what might look like social paranoia. James gradually proved capable of partial accommodation to the ethos of the common law. He reaffirmed the Elizabethan insistence on the imperial nature of his office. By this was meant not principally that England held external possessions, but that it was not beholden to a foreign power. It was, then, a responsibility of ruling office not to alienate that English *imperium*, the implication of which was the maintenance of laws and Protestant religion (see, e.g. Bilson 1585). This his Coronation Oath also required. In speeches before Parliament James came to mute his understanding of his liberty of office. All monarchs though initially free could choose to live according to the laws as he had done, exercising prerogative only in abnormal circumstances (James VI & I 1609/10, 1616: 527–8). This was effectively to assimilate prerogative power to casuistic reasoning (Condren 2006: 172–8, 276–81). Theologically, a voluntaristic god on earth was married to something more Thomistic, not unlike the way in which miracles were seen as relating to the laws of nature under the sovereignty of God. James' presence as a self-conscious philosopher-king made some engagement with notions of sovereignty difficult to avoid for the rest of the century, concomitantly making the meaning of the word 'subject' central to debate.

The disputable status of sovereignty can be illustrated by a brief comment on equity. It was accepted that the Aristotelian principle of equity (*to epiktetes*) was essential to the law, to redress merely mechanical application that could become a sort of tyranny, a question made much of in Shakespeare's *Measure for Measure*. Typically for the common lawyer, equity was construed as latitude of expert judgement, within the law. This was analogous to Richard Mulcaster's conception of the prerogative of language, to adjust the rules of custom and rationality as a sort of cultural sovereign (Mulcaster 1582: cap. 13, 157–61). Conversely, for James, it was only through the prerogative of one above the law that equity could be maintained (Cromartie 2006: 108–9, 149, 203–4; Condren 2006: 178–80). It is difficult for us not (p. 592) to construe the matter as a clash of contested sovereignties, or prerogatives, but this is to take things on Jamesian terms. From a common law perspective, sovereignty itself could be part of the problem, an excuse for meddling intrusion. In this way, the insistence on prerogative power marking sovereignty, even when casuistically restricted to cases of extremity, could be re-described as arbitrary will. Thus would Civil War polemics convert absolute sovereignty into tyranny, a concept of office into definitional abuse.

James' insistence on the centrality of sovereignty, however, got a fortuitous boost from the Gunpowder Plot of November 1605. James' response was to impose an Oath of Allegiance on his Catholic subjects. Catholic Appellants (for example Sheldon 1611) defended this as within his sovereign right (Knolles' translation of the Catholic Bodin was in this way timely); but for the Papacy the Oath of Allegiance was interference: an oath was always an act of the soul before God, the priest a mediator (Jones 1999: 41–51; Patterson 1997: 75–123). The result was an escalation of verbal hostilities. The papal side rehearsed arguments about *plenitudo potestatis*, as universal sovereignty, with the corollary that no allegiance was owed to a tyrant, and intimations that tyrannicide was permissible. James and his supporters responded by arguing that he had required only secular not spiritual obedience; it was the Pope who was tyrannically intruding on James' sovereign right to impose oaths. These arguments were backed by post-Marsilian attacks on the systemic tyranny of the Holy See. Venice had been under an interdict from the papacy and the threatened Republic, asserting its own claims to absolute sovereignty, formed something of an alliance with the embattled James (Patterson 1997: 36–7, 115–17, 246–8). The importance of this was to make manifest the Bodinian point that absolute sovereignty transcended institutional form. All offices were from God, that of rule, pre-eminent amongst them. The need of rulers to claim divine derivation that might or might not also be sanctioned by human consent, disrupts the view that theories of sovereignty came in two necessarily opposed ascending and descending ideological forms. Nevertheless, the most obvious theoretical legacy of the Gunpowder Plot lay in appropriating absolute sovereignty to a patriarchal manifestation; the imperative voice of the sovereign was as law (see e.g. Mocket 1615; Maynwaring 1999 [1627]: I, 56–71). Whether even this amounted to an ideology of absolutism has recently been doubted (Burgess 1996: 17–62; Cromartie 2006: 148–56). Notwithstanding, the Jacobean controversies show how sovereignty theories provide a litmus test for extreme insecurity; adamant assertions of right could index weakness, or a belief that the world was ethically out of joint.

These points are evidenced by Filmer's vision of the sovereign's office. *Patriarcha* may have been initially drafted to protect James against uncompromising Catholics like Robert Parsons, reworked to defend his son against an overweening

parliament, and finally published posthumously to protect Charles II against more of the same (Tuck 1986: 183–6; 1993: 274–6). Filmer reduced a conception of absolute (p. 593) sovereignty to one idealized form, arguing that only patriarchal monarchy was fully sanctioned, because deriving from Adam’s domestic authority. He dismissed natural liberty as a myth, consent as meaningless if taken as a criterion for obedience; the antiquity of parliament was deemed spurious. The argument had a certain negative appeal and despite the complexity of his royal genealogy, a convenient ethical simplicity; kings were divine and as naturally in office as the first father (Filmer 1680). But it was for many theologically obnoxious because seeming to challenge a necessary obedience of the soul to God; and by the time it was published, quite discrepant with conceptions of the English polity and the consensual conditions on which any political institution in it could operate.

Such dissonances between theory and practice cast light on Francis Bacon’s natural and legal philosophy. Like Filmer, he wrote to enhance sovereign authority and adumbrated the preconditions for converting right into effective power, to help make, as it were, ethical sovereignty legally workable. One precondition lay in the advancement of natural philosophy. This required organized communal endeavour by the sovereign’s philosophers, examining, experimenting, and codifying; and all this, in turn, presupposed a new type of intellectual *persona*, to fill the office of philosopher (Gaukroger 2001: 6–36, 118–31; 2006: 24–34). Needed also was a parallel jurisprudential change and an altered judicial *persona* with a codified, public common law being brought unambiguously under the aegis of a legislating monarch (Martin 1992: 72–104).

Something of the ambition of the Baconian enterprise can be grasped by emphasizing the systemic weakness of all sovereigns in seventeenth-century England: there was hardly a bureaucracy for them to rely upon; there was no police force and only a tiny standing army from the Restoration; there was little money, or organized statistical knowledge of available resources; perpetual reliance upon widespread cooperation and some degree of consent was a necessity (Goldie 2001: 153–94; Braddick 2000). A Royal Society was eventually established under the auspices of Baconian philosophical authority, but the common law, maintained and in some ways enhanced partial independence from the Crown. If Scotland could come close to being a theocracy, England could at times teeter on the edge of themistocracy. A joint Anglo-Scottish sovereignty was no marriage made in Heaven. Bacon’s vision also showed the permeable nature of what has since divided more clearly: natural and legal philosophy could be answers to sovereignty’s problems.

In an unstable period of English history, then, we may expect evocations of sovereignty to assume considerable significance, even if they lacked philosophical elaboration. In the discussions that twisted through the century the principal preoccupations were with the functional essence and the entailments of sovereignty, with its scope, usually conceived morally, and with sanctioning origin and form, all explored to draw out the implications for those in a protective relationship with the ruling office. The result was an oscillation between (p. 594) sovereignty as abstract ethical principle of rule and as a juridical constitutional abridgement.

But at the meta-level there is a further continuity from medieval understandings of the logic of definition and identity. This can give a philosophical inflection even to the most occasional of polemics. Put most succinctly, it was the proposition that since terms had meaning only in relationship, changing one of a set had strict implications for others in it: ‘It is God alone who subsists by himselfe, all other things subsist in mutual dependence and relation’ (Pym 1641; Malcolm 1999, 1: 131). Discussions of sovereignty thus had ramifications for the wider political vocabulary, which in complementary ways circumscribed sovereignty’s meaning. First, its meaning was partly dependent on the words specifying those who were ruled; the most important being the ancient category of political identity, *civis*, citizen, and the medieval one, subject (Latinized only in the sixteenth century) through the definition of which, therefore, the nature of sovereignty could be approached.

Secondly, because meaning presupposed a relative contrast, the scope of office could only be conceived in relation to its abuse or non-existence (dissolution). For most, as sovereignty in any sense was an office of ruling, tyranny was an antonym rather than a predicate variable. Such a point had forcibly been made in the fourteenth century by the egregious hierocratic theologian Augustinus Triumphus: a conception of an heretical Pope is the precondition for defending the true one, for the true manifests the office in conduct, the behaviour of a false is self-deposing (see Wilks 1963: 498–505, especially 502).



Consequently, on what were widespread presuppositions about office and moral identity, even the most elevated affirmations of an absolute sovereign right might coexist with, or even herald imperatives about dealing with, those who in abusing that right became tyrants. The paradox of philosophical applicability is that recognition of relational identity gave not legislative direction for conduct so much as a logic of rhetorical flexibility. This philosophical meta-continuity exploited variously in all sorts of writing can virtually be expressed schematically. The conception of sovereignty was framed both horizontally and vertically:

Rule—misrule (tyranny)

Obedience—defence

Here we have a set of semantic relationships that come close to the Peircian formula for a concept's meaning as the range of its implications. Throughout the seventeenth century, accounts of sovereignty were always formulated in reference to such modes of 'mutual relation'. Counsel remained an office situated ambiguously between obedience and participation in rule (Raleigh *c.* 1600, 1648: 14–17, 35). As vulnerable to accusations of tyranny as rule itself, discussions of counsel and its antonyms could be vicarious confrontations with those holding sovereign power.

Continuity of theme did not prohibit modulations. Sovereignty as a unitary principle of rule was stretched to accommodate institutional plurality. Concern (p. 595) with office-abuse made the medieval distinction between tyrannies of acquisition and exercise of pressing importance. From mid-century, *politica* writing established a firm place in England. As the rights of sovereignty were explicated, especially with their implications for religious belief, something James had tried to avoid, so developed countervailing, more nuanced understandings of what was required by those who were ruled; the notions of subjection were loosened, the status of those who represented them enhanced.

## 25.1 Sovereignty Divided, Civil War, and Tyranny

In 1642 Parliament, as the great council of the realm, put before Charles I *Nineteen Propositions*. The document asserted inter alia Parliament's duty to control the militia, the education of royal children, the treatment of co-religionists and Catholics, and, as a grounding for all this, to determine councillors. The King's advisors, Culpepper, Hyde, and Falkland responded with a considered theory of sovereignty (Malcolm 1999, 1: 148–54, 154–78). They argued that the *Propositions* constituted an unprecedented attack on sovereignty in England, introducing a new model of the polity, which in its interference with his majesty's office was tantamount to tyranny. It insisted that one mark of sovereignty lay in the choice of councillors. It asserted England to be a mixed monarchy, with sovereignty being invested in the customary components of King, Lords, and Commons, acting in concert. Older, more diffuse, and legalistic understandings of England were thus assimilated to sovereignty, which was thus presented as both ethical principle and constitutional abridgement. The move tied King to Parliament, but equally foreclosed on the possibility of Parliament's acting independently of him. As a theory of sovereignty, it had crucial advantages, giving verisimilitude to how the polity had often worked, and by emphasizing balance, it presented a face of royalist moderation.

The debate has since largely been construed as a defining clash over sovereignty (Malcolm 1999, 1: 146–7; Weston and Greenberg 1981). But this is not so. Only *The King's Answer* treats sovereignty as central, a formulation designed to damn Parliament's case as tyrannical invasion. Parliament, however, had been careful to avoid any claim on sovereignty, couching matters in terms of counsel and the concerted voice of 'faithful subjects' presenting a 'dutiful petition' (Malcolm 1999, 1: 148). Relying on a concept we assume to be politically central could, in short, be counter-productive, and processing all arguments through our assumptions about issue saliency loses the subtleties of debate. In the pamphlet controversy that (p. 596) immediately followed, the question of whether sovereignty was the issue remained disputed. All this evidences the decidedly messy, albeit accommodating notions of divided sovereignty that continued along with Jamesian unitary theory of the sort to which Charles actually subscribed. It shows also the continuing uncertainties of relationship between counsel and

rule (Condren 2006: 168–71).

The civil wars of the 1640s generated an unprecedented amount of printed material and it is only with caution that we can indicate the principal understandings of sovereignty shifting through verbal hostilities. Philip Hunton recognized that assertions of ‘absoluteness in rule’, although properly ethical, were difficult to fit with the Parliamentary need to justify resistance to the throne (Hunton 1643: 7). Conceptually, sovereignty had to accommodate some form of allowable disobedience and so Hunton posited a qualification to pure subjection as part of the traditional fabric of the English polity, an incitement, perhaps, for Filmer to rework *Patriarcha* and certainly to Peter Heylin (or Heylyn), who reiterated that sovereign power meant strict obedience (Hunton 1643: 55–61, 64, 65; *contra* Heylin 1643). Hunton’s appeal to English circumstances could be congruent with the belief that history was philosophy teaching by example, but also facilitated the avoidance of abstract and foreign theorization.

One strand of argument cutting across armed division emphasized constitutional balance itself as a principle of rule. *The King’s Answer* was a model of how this could be advocated (further incitement to Filmer). Another way of limiting the scope of sovereign office was to employ a contractual motif, symbolized in a coronation oath. This at once accepted a location for sovereignty in a monarch, and insisted on its abrogation should the contract be broken. It was a remarkably ecumenical *topos*, being found across confessional divisions but was not an independent philosophy of politics (what has since been misleadingly isolated as contract theory). It was rather a buttress to the conventional belief that the *persona* in office was a function of conduct and thus reinforced the rhetorics of nominal definition. Thus, parties to a contract are narrowed to reciprocally abstract identities and breach of contract dramatically alters the relationship between them, severing ties of obligation. In a land of lawyers, contractual images of government could be a reassuring idiom of casuistry.

A further strand amounted to a proof of the central accusation in *The King’s Answer*, a claim to a unitary sovereignty in Parliament to counter the Jamesian restriction of sovereignty to a monarch’s divine right. How far this was a shift in conception rather than an explication of the implicit force of *The Nineteen Propositions* is a moot point. But assertions of parliamentary sovereignty did not occur in any straightforward fashion. There were three variable and, as with the pamphlets of Henry Parker, often intermixed permutations (Mendle 1995). First was the case that Parliament had been denied its rightful share in government (a variation on the duties of counsel). Second was the argument that Parliament was fighting for the King’s office against his person. Conrad Russell has suggested that (p. 597) Parliament’s lack of a personal focus for loyalty required argument to be elevated to this level of abstraction (Russell 1990: 117–18), a plausible polemical rationale, but no proof of a modernizing shift from personal allegiance. In fourteenth-century Scotland, for example, the principle of rule had become a focus of loyalty in the absence of a king (Bingham 1974: 13); and an awareness of the difference between man and office had been central to the Baronial discontent with Edward II (Jones 1999: 18). Seventeenth-century writers, then, provided a new application of a point of scholastic discrimination. Nevertheless, pressed with a degree of interested opportunism, distinguishing man from office was a short step from the third claim, that Parliament itself was sovereign as the representative of the community.

Two inherited senses of ‘representation’ complicated matters. A representative could be a synecdoche, in effect, the same thing as the wider group, like Marsilius’ *valentior pars*, and so accountable only to a later representative. This allowed representation and sovereignty to function synonymously; or, the representative could be accountable to those represented, as Marsilius sometimes understood the *pars principans*. In this more familiar sense, the larger grouping could be the ultimate sovereign. The terms assuming importance in the meaning of representation were underdetermined notions of ‘the people’, or ‘nation’, ‘the Law’, or ‘country’ used frequently enough to assert an *imperium*. An uncertain mix of these variations of parliament as a quasi-Marsilian representational sovereign, or agent of an English empire, were to prove dominant after the execution of Charles I. *Ipso facto* the representatives of the people became as vulnerable to accusations of tyranny as Charles had been.

Questions of tyranny were central to the trial of Charles I. Here, Milton’s voice is important in his mastery of the rhetorics of nominal identity, and the definitional moves that reveal the precariousness of claims on sovereign right. In the



*Areopagitica* Milton had noted the conceptual necessity of evil; without it there could be no meaningful idea of good (Milton 1959 [1644]: 514). In the so-called regicide tracts, this is specified in his concentration upon tyranny and its consequences for circumscribing the duties of rulers. They are entrusted with an office for a purpose and can exist only in the execution of its proper ends. Breach of trust through tyrannous excess requires that the ruled, or more typically the lesser magistrates representing them, revoke the relationship (Milton 1962 [1649]: 204–10). Tyrants are aggressive enemies and must be dispatched. Trial is unnecessary, for tyrannicide is an honour to God (Milton 1962 [1649]: 213). Bodin in making much the same points had (as noted above) restricted his case to attempted usurpation (which was Charles' understanding of Parliament's impertinent counsel to him). Milton, however, focuses on the morally transformative consequences of tyranny *in exercitio*. Charles had not been tried as a sovereign, but as a malefactor: his evil conduct had already transmuted him. 'King and subject are relatives' wrote Milton, 'and relatives have no longer being than the relation' (Milton 1962 [1649]: 229–30, 234). All this was to reassert that the divinity lay in God's office, not in the hulk of (p. 598) an occupant; and that sovereignty lay in some indirect way with those who were ruled, or with the law (Milton 1962 [1649]: 204–6). We continue to call Milton's tracts 'regicide' by ignoring or not accepting his central arguments. These help explain without contradiction why such a vehement republican could sometimes hold kingship in high regard. Morally, kingship was necessary to make the evils of tyranny clear. Practically, most men called kings or magistrates were subject to its destructive temptations.

## 25.2 *De Facto* Myth, Hobbes, and the Aftermath

The execution of Charles, the abolition of The House of Lords, and the declaration that England was now a Republic, destroyed the institutional structure that fitted only awkwardly the expectations of unitary sovereignty theory. It became imperative, and perhaps easier, to reassert the functional ethical essence of sovereignty, so weakening it as an expression of constitutionality. The questions surrounding the rationale, features, and limitations of sovereignty were not new, but they were now urgent.

Among the Bodinian *iura* of sovereignty, the right to impose oaths reassumes centrality after Cromwell and The Council of State decided to impose what was close to an oath of allegiance to the new Republic. The Engagement Controversy that immediately followed has conventionally been pictured as one between might versus right, between the 'Engagers' advocating self-interested acceptance of *de facto* rule, and those insisting on obedience only to *de jure* entitlement. These depictions are quite misleading (for analysis, Condren 2006: 290–313). In fact, both sides of the debate concerned the nature of oaths, the reciprocal moral duties of sovereigns and subjects, and the concomitant nature of tyranny. It was also philosophically informed, and in a range of cases argued with a succinct sophistication. On the pro-Engagement side (conventionally misnamed *de facto* theory), the very distinction between *de facto* and *de jure* rule could be rejected. On Augustinian precedent it was accepted that while most forms of rule originate in tyranny of acquisition, full moral allegiance was due to whosoever properly exercised the office. God requires obedience to a locus of authority for the sake of peace and salvation. The errors of rule, argued John Rocket, were attributes of personal conduct and had no bearing on the moral imperatives of obedience to the office *per se* (1650: 119). Indeed, only in exercise did the office exist. Thus in so far as rulers maintained peace and the security of the laws they behaved as sovereigns, those now unable to do so forfeited previous right; for them to assert it made them (p. 599) tyrannous intruders. Joseph Caryl regarded *de facto* rule as a logical absurdity and concluded that just as in an army, if officers are killed, others must take their places, so it is with the state (1650: 3). Anthony Ascham, in the longest and most subtle of the pro-Engagement tracts, used the issue as an opportunity to explore the conditions framing any oath and the limited capacity of human judgement, especially when confronted by the mysteries of state (Ascham 1651: 54–7, 63–4). He reaffirmed the nominal nature of human political categories and explicated the marks of tyranny in exercise as opposed to tyranny of acquisition; violence rather than justice, theft rather than tax (Ascham 1651: 75–9, 18).

For their part only the anti-Engagers relied on a firm distinction between *de jure* and *de facto* rule, insisting that full allegiance, moral subjection, is owed exclusively to those with a right to act within a designated sphere of authority. They

also saw the importance of nominal identity in office differently. One writer drawing on the strong homologies between ruling and marital office argued that if a man usurped the position of a husband, a wife might well have to submit, but she has no obligation to her oppressor. Therefore, only *de facto* compliance should be given to those who have usurped sovereign office (Anon. 1649; Malcolm 1999, 1: 417–20, 410).

Further, while the Engagers insisted that anything less than a full moral commitment would erode sovereign power, the anti-Engagers argued that to give a moral gloss to tyrannous intrusion actually undermined sovereignty. Men would remain in power only so long as their swords prevailed (Anon. 1649; Malcolm 1999, 1: 396–404).

Again, on both sides, what looked like an oath, albeit an accommodatingly ambiguous one, was symbolic of the wider issues eddying around the new government. The right to impose an oath and the willingness to swear to it, thereby invoking God as a witness, stood for a relationship in office under the auspices of divinity. For the Engagers, to swear was to recognize and strengthen sovereignty; for the anti-Engagers, to swear to those who were not rightly sovereigns was to be foresworn. The arguments were inconclusive but do much to clarify sovereignty's functions and limits within a moral, ultimately theological, frame of reference.

Enter Thomas Hobbes, whose *Leviathan* alludes in passing though fittingly to the surrounding controversy: but there is hardly an aspect of seventeenth-century sovereignty theory on which Hobbes' political arguments do not have a bearing, while his explication of sovereignty is presented as an instantiation of his understanding of philosophy. *De cive*, published in Europe (1642, 1647), belongs to the tradition of post-Bodinian *politica* writing and *Leviathan* brings that tradition, if not the academic style, into England and English.

For Hobbes, a locus of sovereignty, irrespective of form is the *sine qua non* of society itself. Like Arnisaeus, he conceived the state or commonwealth as quintessentially an order of subjection, beyond which was a condition of uncertainty amounting to war. Appreciating this and its implications required systematic (p. 600) causative analysis on the basis of rigorous definition. This was to go further than Bacon who had seen science as serving the sovereign. For Hobbes, science explained and made manifest sovereignty's necessity; it was a solution to the problems caused by human nature and the proper, philosophical enquiry into such matters began, he proclaimed, with him. His was the sort of philosophic *persona* Baconian theory had called for, independent, energetic, and rigorous.

Paradoxically, for Hobbes, it is the anti-social proclivities of humans that ultimately explain the achievements of peace, for sovereign power as a response to them was an immediate condition for any philosophical achievement. In each of his formal political statements Hobbes employed a contractual hypothesis to make his point. Human beings predominantly driven by fear and the desire for power are at least sufficiently rational and mutually self-aware to band together to create a sovereign to alleviate the intolerable situation their natures cause. In effect, they trade unlimited but useless right for limited privileges secured under law. In the *Leviathan* formulation, they *authorize* a sovereign, as their unaccountable representative in which act, concomitantly, they become subjects (*Lev.* chs 121–9).

It is, then, the office of the sovereign not to provide mere peace, but the sense of security and well-being for which it is made (*Lev.* ch. 30: 231–44). Similarly, failure to provide a sufficient security dissolves the relationship between sovereign and subjects, allowing the hitherto subjected to seek protection elsewhere. Again, the individual condemned to death by a sovereign can have no obligation, as anticipated execution destroys protective relationship. Among the most important aspects of sovereign authority is the right to legislate and promulgate all laws and choose its own counsel. It may impose oaths, though Hobbes diminished the significance of the process, arguing that an oath adds nothing to a prior obligation arising from subjection and cannot detract from it (*Lev.* ch. 14: 99–100; 1969 [1640]: 1.15.16; Sanderson 1854 [1650]: 5, 21–5).

The most disturbing aspects of his expansive notion of the sovereign's office were, first, a systematic diminution of the framing significance of natural or divine law for society. Sensible of how easily an appeal to such law could be made to undermine sovereign authority, Hobbes urged that all divine imperatives, of which we could be sure, amounted simply to the

injunction to live in peace. The sovereign whose duty it was to secure that peace therefore had to be the mediator of such law. So despite frequent caveats about confusing religion and philosophy, in the latter parts of *Leviathan*, Hobbes elevates the sovereign to the status of high priest, or a god on earth. The second implication followed closely. Sovereignty's scope extended to all socially significant and thus potentially disruptive forms of religious belief, with those aspects of belief necessary for salvation being reduced to what was consistent with civil obedience. As Hobbes went beyond Bacon in making sovereignty subject to scientific analysis and showing science itself to depend upon sovereignty, so in his Erastianism he went beyond James VI & I. Priests and lawyers alike were denied independent authority and councillors were servants. The notion (p. 601) of a mixed monarchy or divided sovereignty was confused philosophy and a civil war in the making.

Hobbes provided a philosophy that was also polemically geared to the controversies around him. His exploration of contract undercut its conventional oppositional uses. As a sovereign was not a party to, but consequence of any mooted contract, only subjects could be guilty of contractual breach. The lack of any appeal beyond the sovereign's law was designed to silence priests and lawyers. The stark contrast between peace and war was partly made to render the very word 'tyranny' redundant. Tyranny merely signifies an enemy, it is monarchy 'misliked', just as anarchy is disliked democracy, rule by assembly being a licit form of sovereignty (*Lev.* ch. 19: 130). War is the true antonym to sovereignty in any manifestation. Indeed, one of the most striking implications of Hobbes' philosophy was a posited reform of political vocabulary. If tyranny was superfluous, liberty, metaphysically was almost ubiquitous; if not constrained we are always free; though we may not like the choices we have. Politically, freedom (excluding the sovereign's) is merely a latitude allowed by the law (*Lev.* ch. 21: 145–54). Hobbes' arguments were designed to confront heady appeals to threatened liberty used to mobilize action against the commonwealth. Restricting justice to a function of the sovereign's law subverted another term prominent in the criticism of rulers. Appeals to conscience were similarly destabilized; it was either totally internal and so of no social significance, or a matter of opinion, something the sovereign had every right to control in the interests of peace (*Lev.* ch. 7: 48; ch. 29: 223; Hobbes 1969 [1640]: 2.6.12). As all those governed by a sovereign were subjects, citizenship referred to those who had given up their arms for sovereign protection (Hobbes 1651: 93–4).

It proved easy to see Hobbes as advocating tyranny; denying its existence could be symptomatic evidence. Implicit in his arguments were two forms of response: first, the commonplace insistence that even bad rule is better than none; second, that the sovereign is created to serve the needs of protection. Although the sovereign has no obligation to the subjects, obligation does not, as it might be taken now, exhaust responsibility. The entirely conventional specification of sovereignty as an office was to make this reassuring point. Hence his insistence that more than 'bare Preservation' is required; the sovereign, through law and instruction must reassure creatures whose actions stem from perception. A too violent or erratic sovereign is counterproductive, even a contradiction in terms (*Lev.* ch. 30: 231). Ruling well is the best security, but no external body can insist upon it without effectively becoming the sovereign itself.

Hobbes' works on sovereignty, culminating with *Leviathan*, reset the terms of debate. John Hall's little discussed but powerful and systematic *Of Government and Obedience* (1654) gives some sense of this, despite in many ways being closer to Filmer's *Patriarcha*. Hall's work is an unabashed affirmation of Jamesian free monarchy, turning Hobbesian preference for the rule of one into dogma, derived from a similar conception of human nature, but rejecting all talk of consent and (p. 602) contractual explanation (Hall 1654: 1, 4–6, 9). From the conventional starting point that kings and subjects are relative terms, Hall argues that misuse of words deludes people into thinking that subject means more than subjected and that polyarchical government can be stable (Hall 1654: 1, 6, 9). Tyranny takes on meaning only in relation to slavery: both words exist to one side of governmental relationships, so are redundant, yet in practice they operate damagingly because of their accommodating vagueness (Hall 1654: 2, 1). Public good is also empty. Representatives are groups developing interests apart from the rest of a subject populace; the only true representative is the sovereign, God's viceregent on earth (Hall 1654: 2, 1). Freedom then, is an attribute of the sovereign, a free subject properly an oxymoron (Hall 1654: 2, 3). The specific conclusions are less significant than the explanatory significance given to the words in the ambit of sovereignty, and it is in this sensitivity that Hall writes in an authentically Hobbesian idiom.

Given the scope of Hobbes' theories, the paradoxical extremity of some of his conclusions, and the often provokingly

satirical tone, it is not surprising that he was controversial. At once fashionable and demonized, respected and ridiculed, he became a touchstone for the rest of the century and the full extent of reactions to him is only now becoming apparent (Parkin 2007). Isolating sovereignty from a range of issues is a little artificial but the following lines of critique were perhaps the dominant ones: his derivation of sovereignty from a particular picture of human nature, if not offensive was found to lack explanatory cogency; the extension of the *iura* of sovereignty to include the interpretation of divine and natural law was theologically unacceptable and led to exposing the eccentricities of his biblical exegesis; and the concomitant denial of any justice independent of the sovereign and the Erastian diminution of the importance of the priesthood were thought to have consequences too unpalatable to contemplate, at least by many of the clergy. Central to these problems lay the reduction of the sovereign relationship to one of rule and subjection, *simpliciter*, in the style of Arnisaeus. Here there were two principal reactions, between them setting the scene for the more workable, if less elegant understandings of sovereignty predominant in English political thinking until the re-emergence of a Hobbesian positivism in the nineteenth century that could adopt Hobbes for the cause of parliamentary sovereignty.

For Harrington, Hobbes, albeit the greatest philosopher of his age, failed in his reductive theorization of sovereignty. Prior or inferred consent could never guarantee political survival, especially given Hobbes' perceptively fissiparous characterization of humanity. Harrington drew on continental notions of interest as central to political analysis, on Machiavelli, and the medieval Italian republican institutionalization of political distrust (Harrington 1992 [1656]: 9–13, 20–5; Parkin 2007: 177–85; Scott 1993: 133–63; Pocock 1975: 383–400). His alternative was to urge that the ruled needed an interest, a property in the system beyond assurances of protection. So the *iura* of sovereignty, vitally, its counselling and decision-making, had to be divided, like a cake. One cut, another chose, with both parties having an (p. 603) equal investment in fair distribution (Harrington 1992 [1656]: 22). Without such self-interested balances of commitment among citizens, any polity would fall, as history demonstrated. From such visions of integrated balance, once more tying sovereignty to the vagaries of institutional structure would develop a major strand of self-conscious constitutional fashioning—a re-emergence of the practices of the medieval city republics.

Lawson divided sovereignty in a different fashion. He was an early critic of Hobbes, but his views were in many ways similar when he produced his own systematic *politica* treatise, drawing on the inheritance they shared (Condren 2001: 287–303). Lawson's *Politica*, finished in 1660, was the first part of a larger work never printed. It plots the parallel principles of sovereignty in church and state. Accepting that any political organization is an order of subjection, Lawson argued that such hierarchy can only come from a prior community of equals. Thus any church structure presupposes a body of believers, an *ecclesia* (his understanding of this term is the same as Hobbes'). Analogously, a secular order can only arise from a community of fellows (*cives*) living under natural law (Lawson 1992 [1660]: 22–40, 41–4). The consequence is a division of sovereignty into *real* and *personal*, a distinction taken from the vocabulary of Roman property law as used by the *politica* writer Christopher Besold, of whom he is also critical (Lawson 1992 [1660]: 45–6). *Personal* majesty may take many forms, with its functions delineated in different ways, for example into legislative, judicial, and executive (inapplicable in England); but personal sovereignty is, as such, a conceptually unified locus of government, an office of rule in the interests of peace (Lawson 1992 [1660]: 49–57). Considered on its own, its rights extend close to Hobbesian extremes. Like Hobbes, Lawson has a minimalist understanding of the beliefs necessary for salvation, and this consigns most religious doctrine to the realm of *adiaphora*, things indifferent, that may be left alone or controlled by the sovereign. All under the *personal* sovereign's authority are thus subjects, made such by the very creation of a political order.

*Real* majesty, however, remains in the community as a whole, or its representative weightier part, having a latent reforming or creative capacity. Lawson even alludes to it as greater in some way than personal (Lawson 1992 [1660]: 47). Lawson's main argument, however, is that members of any polity have a dual identity carrying potentially diverging patterns of imperative; where subjects must obey even tyrants, citizens need not. In isolating a constituent tension in political identity Lawson's point was not to advocate a line of action, but to promote clear thinking by refining the language of sovereignty. Whatever we do is always in some capacity for which appropriate terms are needed. Thus Bodin's conflation of citizen and subject was a grave error (Lawson 1992 [1660]: 220). So too, members of an organized church are subject to its rules but remain believers irrespective of church form, and in the face of extreme ecclesiastical abuse, they may separate to begin

again. With any dissolution of *personal* majesty, however, all the implications of (p. 604) subject status are similarly dissolved. The destructive consequences for a vocabulary presupposing sovereign order are clear and illustrated by the linguistic confusions that came with civil war (Lawson 1992 [1660]: 68, 129–34, 230–1). If *real* sovereignty remains, a new form may be generated and sanctioned through, for example, a convention; something like this, couched in these terms, was to eventuate in 1660 and in 1689–1690, when Lawson’s characteristic conceptual vocabulary would resurface. His own argument bypasses the problematic notion of contract. It reinstitutes a meaningful conception of tyranny and is a response to Hobbes’ (Bodinian) subversion of citizenship, and his, and Hall’s equation of representation and rule. Explicitly drawing on Marsilius, and having suspected Hobbes of disguising a similar reliance, Lawson effectively incorporated the Paduan’s distinction between the *pars principans* and the *legislator humanus* or its representative the *valentior pars* into post-Bodinian sovereignty theory (Lawson 1992 [1660]: 140, 211).

Hobbes would be partially assimilated to English thinking through the importation of Pufendorfian adaptations (Pufendorf 2003 [1691]); and through writers like Lawson and Harrington, who only partially distanced themselves from him. They may be taken as standing for increasingly acceptable, if evasive reformulations of the nature of sovereignty, thus insuring its centrality in debate.

In the ‘Second Treatise’, Locke commends James VI & I for understanding and executing his office (TT II. 200). In context it stands as an implicit criticism of his grandson, Charles II. Early in his career Locke had endorsed the sovereign’s right to control all matters of religious indifference, but he regarded the incipiently Catholic conduct of Charles anything but indifferently. Thus like Milton, Locke’s exploration of sovereignty is principally through its antonym tyranny, the criteria for its identification, the imperatives and the consequences of acting against it (TT II. xiii, xviii). He began in the ‘First Treatise’ by clearing the grounds of Filmer’s *Patriarcha* on pretext of its popularity, an operative theological targeting of a work that may have been less fashionable than convenient. Like so many, Locke went on to reiterate, in contrast to Filmer, that sovereign power is a revocable trust (TT II. 149, 222). Like Harrington, he believed that the ruled had a property in the system they created for a purpose; like Lawson, that a community precedes and continues with governmental hierarchy and that dissolution of a government is not dissolution of society (TT II. v, 134, 211). Like Hobbes, he employs a fiction of contract, but reaffirms the conventional force of the imagery Hobbes had inverted, and Locke reverses Hobbes’ concept of a state of war. For Locke, tyranny *being* rebellion creates a state of war, apropos of which modern commentators who casually style Locke as a defender of a right to rebellion quite misunderstand the conceptual vocabulary he was using. Dissolving governmental relationships returns the people to a state of nature from which they may recreate a political order (TT II. vii, xviii, xix). And like all of these writers, Locke’s understanding of sovereignty is itself governed by notions of nominal identity. Rulers and allegiance (p. 605) to them survive only in the proper exercise of power. When this is tyrannically abused, a magistrate ‘ceases in that to be a Magistrate’ (TT II. 202). At the end of the century, even in polemic geared to decisive political action, a large part of sovereignty theory and its sprawling vocabulary lay in the protocols of word use. Indeed, the continued relevance of a concept of sovereignty was largely contingent on the room to manoeuvre afforded by nominal identity in office. The attempts to shape it to the complexities of English life, however, also required the loosening of a unitary model of ethico-juridical command. In this way, an ethical image of rule was partially assimilated to a privileged institutional arrangement. It was from writers such as Locke, that the materials would be gathered for justifying some sort of constitutional democracy, carrying with it all the ambivalences to sovereignty in its unacceptably rigorous, reductive, and unitary elaborations.

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## Toleration

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## Abstract and Keywords

This chapter examines the conception of the notion of toleration in Great Britain during the seventeenth century. It explores the origin of the concept of toleration and suggests that John Locke's theory in *Epistola* provides the most decisively philosophical iteration of the British sectarian pluralist argument for toleration in the seventeenth century. The chapter also considers the relevant works of Thomas Hobbes, William Chillingworth, and Roger Williams.

Keywords: toleration, Great Britain, John Locke, *Epistola*, Thomas Hobbes, William Chillingworth, Roger Williams

TOLERATION is often seen to be a distinctively British virtue and the seventeenth century the period in British history where a properly philosophical defence of toleration emerged and flourished. The revolutionary middle years of the century witnessed an upsurge in tolerant theory and practice. Toleration was ultimately enshrined in the law of the land in the Toleration Act of 1689, and it was a British philosopher, John Locke, who gave expression to one of the most important theoretical defences of toleration in his *Epistola de Tolerantia* of the same year. These facts suggest the bones of a story that nineteenth- and earlier twentieth-century commentators found hard to resist, of the rise of toleration in theory and practice, emerging from the peculiarly enlightened circumstances and developments in seventeenth-century Britain (see for example the narrative in Jordan 1932–1940).

A number of qualifications to this traditional narrative, increasingly challenged in the secondary literature, are immediately necessary. Firstly, it is important to resist the thought that the period saw anything like a triumph of toleration, either in theory or in practice. Intolerance of religious diversity remained a dominant and durable sentiment amongst the population at large, and amongst thinkers of any stature. Even the achievements already mentioned reflect something less than the triumph of toleration as we might understand the concept today. As several commentators have pointed out, the toleration of the Interregnum period was a good deal less tolerant than many have supposed (Worden 1984). The Toleration Act represented not so much the triumph of enlightened rational principle, as a tactical political compromise between Anglicans and dissenters joining forces against Catholicism (Spurr 1989). Practical toleration was a fragile and contingent (p. 610) matter and owed little in the seventeenth century to works like Locke's *Epistola*. Even this work does not quite live up to its place in the pantheon of modern liberal political thought. Locke's theory of toleration operated in what, to some modern observers, appears to be a disappointingly theistic register. It also falls a long way short of what we might recognize as toleration today, particularly in denying toleration to Roman Catholics and atheists. Such exclusions, commonplace for tolerationists of the period, underline the limited character of the relatively few arguments in favour of toleration in seventeenth-century Britain, and also draw attention to the profoundly religious character of those positions.

This second point undermines the thought that the case for religious toleration in Britain was built upon enlightened

philosophical foundations. There has been a tendency to associate the rise of toleration with a decline in religiosity, but a cursory inspection of the most thoroughgoing conceptual defences of toleration reveals that the most highly developed British discussions of toleration during the seventeenth century were rooted in particular forms of Christian, specifically Protestant, theology and ecclesiology. As Perez Zagorin has pointed out, toleration, for reasons we shall explore, was an idea proposed by the profoundly religious, not of minds inclined to religious indifference (Zagorin 2003: 9). Indeed, as some authors have stressed, such indifference frequently worked against the idea of toleration (Tuck 1988). This is not to say that secular philosophical positions (particularly forms of scepticism) had no role to play, but that their intellectual impact was largely shaped by the presuppositions of distinctive forms of largely Protestant theology, Biblicism, primitivism, and restorationism (Coffey 1998: 983).

That this was the case leads to a third and fairly self-evident qualification to the traditional story that many of the arguments and concepts involved were peculiarly or uniquely British, or that British tolerationist thought of the seventeenth century somehow set the terms of the European case for toleration. British discussions of toleration in fact trailed in the wake of well-developed positions that had emerged from continental European discussion (see, e.g. Smith 2007). If the majority of the British defenders of toleration in the seventeenth century based their case upon Protestant theology, their arguments largely followed, and were indebted to continental discussion of toleration within several waves of reformed thought ranging from German spiritualism to Polish Socinianism to Dutch Anabaptism and Arminianism. All of the major British writers engaged in thinking about toleration were in a more or less continual dialogue with continental thought throughout the period, and their writings are best thought of as representing a synthesis of broadly European ideas sometimes designed with a European audience in mind. In this context it is worth remembering that Locke's *Epistola*, for example, was not only a response to European persecution adopting some distinctive continental arguments, but addressed in Latin to European readers.

The traditional story about the development of toleration in Britain is thus in need of revision, and historians have already made impressive moves in this (p. 611) direction when dealing with the *practice* of toleration on the ground (see, e.g. Coffey 2000; Walsham 2006). When it comes to a *theoretical* understanding of toleration, however, there is still more work to be done. Part of the problem here stems from the nature of pro-toleration arguments during this period, which deploy an eclectic selection of conceptual resources ranging from the full gamut of scripture and scriptural interpretation, through to sceptical epistemological, political, and pragmatic considerations. Sometimes historians list these components independently of the intellectual structures in which they are used, as if particular forms of tolerationist thought could simply be reduced to their conceptual parts. The recurrence of these features invites the identification of occasionally superficial parallels between authors, sometimes blurring and obscuring the distinctiveness of particular contributions. The scholarship on Locke's theory of toleration offers perhaps the most striking example of this tendency, the distinctiveness of his position in his pro-toleration writings sometimes dissolving when placed next to particular Anglicans, Baptists, Independents, or Levellers who make use of similar conceptual resources (see, e.g. Marshall 2006). Although such comparisons can sometimes be revealing of the character of a particular argument, they often serve to underpin evolutionary schema, which can also sometimes obscure what is distinctive about the particular construction of thought by a particular author.

It may be more helpful to think about the development of pro-toleration thought in a rather different way if we wish to bring out the distinctiveness of British contributions to the discourse. British thinkers brought their diverse and indeed international intellectual resources to bear upon their distinctive local experiences. Those experiences were largely shaped by the peculiar political processes by which the relationship between church and state was de- (and re-)constructed in Britain throughout the century, and this tended to produce distinctive forms of tolerant theory with characteristic preoccupations. For example, perhaps the majority of British tolerationist thinking was preoccupied with the problem of the level of coercive authority appropriate to the state and to individual churches, a feature of the discussion which owed much to the peculiar British interpenetration of a national church and state.

At the beginning of the century, it was almost universally assumed that the church and the state were mutually supporting institutions with powers to control religious practice and belief. Practical political and religious arrangements appeared to

support this view, and there was very limited scope for toleration. Throughout the century this position was subjected to critique by groups and individuals exploring the implications of their theological and ecclesiological presuppositions. For some groups, particularly those separatists from the national church subject to persecution by it, those presuppositions involved the rejection of the connection between the state and the church and the rejection of the legitimacy of temporal coercive authority over the religious beliefs and practices of (p. 612) individuals.<sup>1</sup> This was a position that typically required a more precise delineation of the relations between political and religious spheres and thus tended to result in principled theories of toleration that effectively licensed the political recognition of deep religious pluralism.

But it should be noted that this was not the only or exclusive route to recognizably tolerant theories and ecclesiologies. In England in particular, another common response to the problem of religious diversity was not to split religious and political jurisdictions, but given the fact of their conflation, to attempt to relax the doctrinal conditions attached to the national church in order to comprehend a broader range of Protestant believers, thus maintaining unity without a restrictive uniformity of doctrine. This contrasting strategy, which Hans Guggisberg has called ‘the theology of reduction’ (Guggisberg 1983), was often inspired by Erasmian sceptical approaches to Christian dogma, and would go on to inform the positions of those Erasmians, Independents, Erastians, and later in the century Latitudinarians, who wished to include a greater diversity of opinion within the established church. The two positions had a tendency to produce very different kinds of tolerant outcome (to be distinguished later in the century as ‘toleration’ proper and ‘comprehension’), even if they could occasionally coexist, albeit at times rather uneasily.

## 26.1 The Idea of Toleration

Classically *tolerantia* stood for the bearing of anything that was a burden to the human body or mind; early Christendom developed a second understanding of *tolerantia* as the bearing of earthly suffering. In the Middle Ages, as Istvan Bejczy has shown, *tolerantia* came to take on a political and social meaning as the forbearance of bad people (the immoral, the heterodox, the infidel) by those who had power over them (Bejczy 1997). The concept thus took on its modern association with the idea of the self-restraint of the tolerator when confronted with something of which they crucially disapprove (Horton and Nicholson 1992: 2). Early modern Europeans generally shared this modern sense that toleration was fundamentally about putting up with something to which one objects, and much of the discussion of toleration in Britain has this distinctive conceptual shape.

For the most part, as John Coffey has pointed out, when British seventeenth-century writers spoke of toleration, they were usually referring to the idea of civil (p. 613) tolerance: that is, the policy of the state towards specifically religious dissent (Coffey 2000: 11). The reason for this, as we have already seen, was that during most of the period the English state was a persecuting state committed to securing religious uniformity through coercive means. The call for civil tolerance typically arose from the separatist critique of the church’s relationship with the state. Civil tolerance could mean a number of things. At a minimum it could mean relief from persecution (‘indulgence’), but more substantially recognition of a freedom to worship as one pleased (‘liberty of conscience’), or most radically, complete disestablishment, or the separation of church and state. The other common usage of the term was with regard to ecclesiastical tolerance, which concerned the degree of diversity within the church and was typically associated with the theology of reduction.

Naturally it is difficult to make a comprehensive survey of the various arguments for toleration, but in selecting some of the most striking, if not most influential cases for toleration, it should be possible to identify the structural characteristics of the various pro-toleration positions, the presuppositions upon which they relied, and the scope of the toleration that they allowed or permitted. The structure here is chronological and consists of examples which are not designed to be linked in a teleological and developmental manner. As we shall see, such a structure simply cannot make sense of a complex situation in which groups and individuals produced at different moments and in response to different agendas and arguments which, although they shared certain family resemblances and conceptual components, often produced very different constellations of thought.



## 26.2 Early Tolerationist Thinkers

Some of the first concrete examples of principled cases for toleration in seventeenth-century England emerge from separatist Baptist writers in the reign of James I, and they serve to underline the ways in which such arguments developed from very distinctive theological and ecclesiological presuppositions. Anabaptism originated in Germany during the early Reformation and the label referred to groups and individuals who rejected the necessity or validity of infant baptism on the grounds that baptism should follow, and not precede, a personal confession of faith. Underpinning this belief was a conviction that individuals were morally competent to find their own way to salvation, a position that undercut much of the traditional argument in favour of institutional coercion in matters of religion. The voluntarism implicit in the Anabaptist view helped to emphasize the nature of the church as a voluntary association of believers, and crucially one that drew (p. 614) inspiration from the nature of the early Christian church as a purely spiritual body quite separate in character from forms of temporal association like the state. In terms of toleration the most important outcome of these positions was the thought that Christians should reject the conflation of church and state and any use of violence in the pursuit of religious ends on the grounds that the use of corporeal and capital punishment in religious matters was inconsistent with God's will. The earliest versions of this ecclesiological restorationism by writers like Balthasar Hubmaier (1481–1528) resulted in some of the earliest European pleas for the complete toleration of heretics on the grounds that neither the church nor the state had any business coercing the heterodox. The suggestion that persecution was entirely contrary to the tenor of the teachings of Christ and the early church (itself a persecuted sect) would remain one of the major components of sectarian pro-toleration arguments throughout the early modern period.

Thomas Helwys (1550–1616) established the first General Baptist church in England and in *A Short Declaration of the Mystery of Iniquity* (1612) articulated a distinctive ecclesiology which offered one of the first, and one of the most comprehensive defences of toleration to appear in Britain during the century. In common with his continental predecessors, Helwys sought to clarify the relationship between church and state. He argued that the state as a temporal body, although it had jurisdiction over purely civil matters, had no coercive authority in spiritual matters and any attempt to exercise such a power was a misunderstanding of God's will and therefore completely illegitimate. As Helwys put it, the King's power 'extendeth to all the goods and bodies of his servants', but not their spirits (Helwys 1612: 41). Christ had made it clear that his kingdom was not of this world, an injunction that restricted interference between this and other-worldly affairs. In terms of religious belief, Helwys maintained that this could only be an individual matter between the believer and God, one in which the believer was exclusively responsible for their own fate. In line with the voluntarist presuppositions of his Arminian soteriology, Helwys made it clear that belief could never be coerced; the right of private judgement must be given free scope, and every individual must seek and find truth in their own way, subject only to the power of the Spirit and the Word. This striking plea for unrestricted Christian liberty converted into a call for unlimited toleration of religious belief, including the toleration of religious error: 'For men's religion to God, is betwixt God and themselves; the king shall not answer for it, neither may the king be iugd betweene God and man. Let them be heretikes, Turcks, Jewes, or whatsoever it apperteynes not to the earthly power to punish them in the least measure' (Helwys 1612: 69). Strikingly, Helwys was even prepared to countenance the toleration of Catholics, who although they might be prosecuted for a breach of the civil law, should be tolerated with regard to their religious belief. This distinctive theory was not, it should be stressed, a plea for *civil* rights to toleration (which interestingly rarely constitute part of early modern arguments for toleration), so much as a recognition of the theological necessity of (p. 615) religious toleration. As Helwys himself claimed, the magistrate simply had no right to offer or retract toleration, as religion was no concern of the magistrate at all, a position that would be characteristic of the sectarian attitude towards the role of the state.

A similarly radical position can be found in Leonard Busher's *Religions Peace* (1614), which followed Helwys in rejecting the conceptual legitimacy of a persecuting national church. Like Helwys, Busher's largely scriptural case appealed to the thought that false religion could only be rooted out by the 'Spirit of Christ and the doctrine of the Word of God' (Busher 1614: 2) in line with the practice of the primitive Christian Church: 'we never read, nor shall ever read, that the apostolic church, or such as have derived their faith and discipline of her, did ever persecute' (Busher 1614: 16). In proposing

toleration, Busher had recourse to the parable of the wheat and the tares (Matthew 13: 24–30), one of the key texts of European tolerationist discourse, with its suggestion that Christ intended the godly and the ungodly to live together unmolested until the day of judgement. Busher's typical use of this text suggested that individuals were not competent to distinguish between the tares and the grain, and that much grain had been cut down along with the weeds by the 'weedhook' of persecution (Busher 1614: 24). Like Helwys, Busher's restriction of the state's jurisdiction leads to the radical proposal that King and Parliament 'permit all sorts of Christians; yea Jews, Turks and pagans, so long as they are peaceable' (Busher 1614: 10). The Baptist position, with its classically sectarian ambition to deconstruct the conflation of church and state, would offer an influential template for subsequent tolerationists, but it is a telling judgement upon perceptions of its radicalism that few thinkers before the 1640s were prepared to follow its implications in recommending the kind of pluralism envisaged by Helwys, Busher, and his colleagues.

The alternative assimilative strand of latitudinarian tolerationism, with its theology of reduction, also received influential articulation during the first half of the century, most notably in the hands of William Chillingworth, John Hales, and Viscount Falkland. In contrast to the pluralising tendency of sectarianism, this tradition was characterized and influenced by the Erasmian and Arminian sceptical tendency to reject dogmatic doctrinal positions and reduce Protestant Christianity to a common core of shared belief that could encompass diversity of practice. William Chillingworth, whose own religious odyssey saw him convert to Roman Catholicism in 1629–1630 and revert to Protestantism in 1634, was perhaps the most influential British spokesman for this tradition in *The Religion of Protestants a Safe Way to Salvation* (1638) (for Chillingworth's thought see Orr 1967).

An important part of Chillingworth's tolerationist position emerged from his sceptical response to claims of religious infallibility on the part of persecuting churches. Chillingworth's case was epistemological: if the certainty of a conclusion can never exceed the certainty of its premise, and none of the premises underlying claims to infallibility were any more than probable (as Chillingworth suggested), (p. 616) then the churches claiming such infallibility were making illegitimate epistemic claims. Chillingworth's probability-based scepticism about institutional claims to religious authority went hand in hand with a belief (shared with the sectarians) that individuals are primarily responsible for working out their own salvation. Following continental Socinian arguments (Mortimer 2010), he asserted that individuals were competent to do so through their possession of natural reason and the fact that God had set forth his saving promises clearly in His Word. Conscientious and free rational enquiry into God's will as revealed in Scripture would uncover what was essential in terms of doctrine. Chillingworth was notoriously reluctant to lay down a prescriptive list of fundamentals, and avoided the question by arguing that salvation depended more upon an honest, dispassionate, and rational search for truth, with the Bible as the sole authority. This position implied a certain amount of toleration as a necessary condition of free enquiry, but the resulting latitude was more intellectual than institutional. Even though Chillingworth rejected some of the more dogmatic aspects of Anglican doctrine (including the heretical status that it attributed to Arianism), he still defended the Church of England, which was, he argued, in its 'constant doctrine', 'so pure and orthodox that all in it shall be saved', and that 'there is no error in it which may necessitate or warrant any man to disturb the peace or renounce the Communion of it' (Chillingworth 1638: sig. §§§§2<sup>v</sup>). The same was true of other writers like John Hales and Viscount Falkland, whose sceptical willingness to dissolve the importance of the internal doctrine of the church necessarily led to suspicion of sectarian solutions which sought to pluralize the Protestant community institutionally rather than bring about an intellectual unity. This fundamental tension would persist between the two traditions throughout the century in spite of the many positions that they nominally appear to share.

## 26.3 Tolerationist Thought in the English Revolution

The high point of British tolerationist thought occurred during the 1640s, primarily as a feature of the response to the disintegration of the traditional forms of political and ecclesiastical authority in the early years of the decade. As the political authority of the King was challenged on the battlefield, so the ecclesiastical authority of the Episcopal state church was challenged by Parliament and the new Presbyterian establishment contemplated by the Westminster Assembly (1643).

However by this stage English Protestants were becoming increasingly divided about the most desirable alternative to the Episcopal order, and the (p. 617) Presbyterians faced opposition from Independent Congregationalists who rejected Presbyterian and Episcopalian models of national church government and defended the right of self-government for each congregation. Beyond these groups, the atmosphere of comparative religious freedom had produced a multiplication of sectarian groups and beliefs, and the growing *de facto* diversity gave rise to major debates over the extent to which such religious pluralism should be tolerated or repressed.

Perhaps the most important pro-toleration writer to contribute to this debate was Roger Williams, whose *The Bloudy Tenent of Persecution* (1644) offered one of the most comprehensive sectarian justifications of religious liberty in the seventeenth century (Zagorin 2003: 196). Williams was a separatist who had emigrated to Massachusetts in 1631. His views, although similar in many ways to the earlier Baptist writers, appear to have more in common with sixteenth-century spiritualists like Sebastian Franck, who held that since the time of the apostles no visible church of Christians had existed anywhere in the world. For Williams the corollary of this position was an extreme form of religious individualism, which converted into an absolute commitment to liberty of conscience, and the denial of any form of temporal coercive authority over religious life. Christ at his coming had abolished the Jewish national state and church, forbidding the rule of the sword in spiritual matters. Christ's decree that conscience should be free debars the magistrate from control over religion and worship, which are essentially matters of personal belief. Like his early seventeenth-century predecessors, Williams appealed to the parable of the wheat and the tares as the basis for a remarkably extensive argument for toleration that encompassed Catholics, Jews, Turks, anti-Christians, and pagans.

The intensely theological foundations of Williams' argument produced a striking political and ecclesiological theory to underwrite the practical toleration of religious pluralism. In a situation where religious matters could not be legitimate concerns of earthly authorities, the state could only be understood as an entirely secularized political order in which citizenship and political membership were completely divorced from questions of religious belief. States, Williams argued, are 'essentially civil, and therefore not judges, governors, or defenders of the spiritual or Christian state and worship' (Williams 1963: 3). In a civil context churches, where they were formed, could only be understood as voluntary associations 'like unto a corporation, society, or company of East India or Turkey merchants' (Williams 1963: 73) and subject only to sanctions when they threatened the purely secular ends of the state. The radical religious pluralism implied by this distinctive vision sparked a major debate in England, and over the next decade Williams' position was attacked by over a hundred pamphlets. The conceptual separation of the secular state and religion championed by Williams inspired other (mostly Baptist) writers to endorse wide-ranging forms of toleration, although pro-toleration writers varied in how far they would go. Some, like Christopher (p. 618) Blackwood, were prepared to tolerate differences in church order, but not what they took to be fundamentals in doctrine (thereby excluding Roman Catholics and Socinians) (Blackwood 1645), whereas a few were prepared to question the right to punish idolatry and blasphemy where there was, crucially, no violation of the public peace. It is also worth noting that although the vast majority of pro-toleration writers deploying this position were from the radical end of the religious spectrum, this did not prevent the development of the separatist position amongst even divine right royalists, troubled as they were by the fate of Episcopal Anglicanism. During the course of 1646, for example, the absolutist royal chaplain Michael Hudson made it clear in *The Divine Right of Government* that the monarch's extensive rights only extend to 'externall duties' and that conscience should be free, a position that ultimately implied that diverse beliefs, including Roman Catholicism, must be tolerated (Hudson 1647).

If the separatist argument for the structural disjunction of church and state (and Williams' version in particular) frequently underpinned the rejection of civil intolerance in the 1640s and beyond, it increasingly came to be accompanied by more sophisticated versions of the fallibilist sceptical position that defended toleration as a necessary implication of human epistemic limitations. Such arguments had been used by sixteenth-century continental writers such as Sebastian Castellio and Jacob Acontius, but they became particularly important in the English context where toleration arguments were often aimed at priestly as well as magisterial claims to authority and knowledge. In the 1640s this was very much the situation for all writers confronting an increasingly intolerant and persecutory Presbyterianism.

Although such arguments drew upon the resources of philosophical scepticism, it would be a mistake to suppose that they operated independently of a theological framework, or involved the rejection of traditional truth claims. Typically the fallibilist argument rested upon a providentialism that saw a person's sincere individual search for salvation as part of a plan that would ultimately lead to the revelation of divine truth. The requirement that the believer should find their own way was precisely the reason why human authorities could not be allowed to interfere with what is essentially a divinely ordained process, but it should be stressed that within this argument religious pluralism was not something to be embraced for its own sake.

One important proponent of this sort of position in the 1640s was the Independent leader John Goodwin (1594–1665), whose journey away from Calvinist orthodoxy had led him to a belief that God would save anyone who believed in and sought him according to their particular knowledge and ability. Goodwin made his strongest statement in favour of religious toleration in his *Theomachia* of 1644, where he embraced the sectarian rejection of civil authority over religion quoting Acts chapter 5 where the Jewish leader Gamaliel enjoins his co-religionists not to persecute Christians 'lest yee be found even fighters against God' (Goodwin 1644: 1). (p. 619) Intolerance here implied an ungodly arrogation of an unreasonable human infallibility and generated more problems than religious heterodoxy itself. As John Coffey suggests, Goodwin's anti-authoritarianism created space 'for godly individuals to make their own choices about their spiritual lives' (Coffey 2006: 114).

The scope of toleration permitted by this fallibilist approach again varied according to the theological and political presuppositions of the writers articulating it. Goodwin clearly countenanced tolerance for law-abiding sects of sincere believers. Others could take the argument in a much more explicitly radical direction. The Leveller William Walwyn relied upon the fallibilist argument to claim that 'one sort of men are not to compell another, since this hazard is run thereby, that he who is in an error, may be the constrainer of him who is in the truth' (Walwyn 1644: 11–12). The argument would form the basis for later claims that 'it cannot be just, to set bounds or limits to toleration', not even for an individual 'whose mind is so far mis-formed as to deny a Deity, or the Scriptures' (Walwyn 1646: 8–9). Walwyn was unusual in extending toleration quite so far. The Anglican Jeremy Taylor's version of the fallibilist argument also justified toleration on the grounds that human authority was insufficient to determine the truth (thereby allowing the toleration of Anabaptists and Roman Catholics), but was more assertive about the right of the political authority to determine the scope of toleration (Taylor 1647). John Milton's *Areopagitica* famously condemns persecution by fallible humans as true heresy, and also celebrates the new pluralism of belief as a sign of the vitality of a renewed search for religious truth. But that said, Milton's commitment to a particular Protestant brand of truth-seeking led him to exclude Roman Catholics, on the grounds that Catholicism sought to eliminate other religions and civil authority itself (for Milton and toleration see the essays in Achinstein and Sauer 2007). It also excluded Antinomians, whose beliefs liberated them from the imperatives of the moral law. The examples serve to underline the extent to which even radical tolerationist thought was typically not about freedom as an end in itself (an alien notion for the vast majority of early modern writers), and that it was, more often than not, constrained by the nature of the theological and political ends to which it was subordinated.

These qualifications go some way to explaining why the Cromwellian period, although characterized by a greater degree of practical religious freedom than had ever been known in the British Isles, nevertheless failed to produce much by way of enlightened thought about toleration. Indeed it would be a mistake to assume that the pragmatically tolerant policies of the 1650s were closely connected to the arguments of radicals like Williams, Goodwin, and Walwyn. The Independents ultimately favoured by Cromwell in fact entirely rejected the idea of unqualified toleration and extensive religious pluralism. The views of John Owen, Cromwell's Independent 'Pope', are an instructive example, in that his enthusiasm for toleration operated within tightly specified boundaries encompassing orthodox Trinitarian Protestants (for discussion see Worden 1984).

## (p. 620) 26.4 Thomas Hobbes

If the Cromwellian case for toleration has looked rather disappointing upon closer inspection, those in search of a more distinctively philosophical approach to the problem of toleration have made the claim that such an approach can be found in the writings of Thomas Hobbes (for recent discussion see Curley 2007). At first sight, this would seem an unpromising suggestion, given Hobbes' traditional reputation as an uncompromising authoritarian. For Hobbes, crucially, the church and the state are one entity. The extensive politico-religious power vested in Hobbes' sovereign includes an indefeasible right to determine the character of public religious observance, and to that extent Hobbes appears to line up with hardcore advocates of a state church against sectarians in leaving little scope for religious pluralism. But the very fact that the character of the imposition is in the hands of the sovereign reveals one of the ways in which Hobbesian absolutism can be made to flip between authoritarianism and state-authorized laissez-faire. It is up to the sovereign to determine exactly the scope of religious freedom (and other 'liberties of the subject') depending upon their self-interested assessment of the situation, and it is certainly conceivable on the Hobbesian model that, on prudential grounds, there might very well be a reason not to impose politically irksome religious requirements. Although this is a long way from a principled defence of religious toleration by right, it does open up a possibility explored in a notorious (and later deleted) passage of *Leviathan's* chapter 47, in which Hobbes appears to suggest that the best arrangement of religious life mirrors the early Christian period, where every man, 'if it be without contention' is allowed to worship as they like best (Hobbes 1994: 482). It is possible that Hobbes' claim here is satirical (on the grounds that the practical chances of such pluralism existing without contention are zero), but Hobbes' theory does seem to have room for a doctrinally minimalist church state which permits an extensive pluralism of sorts. To a casual reader this utopian vision might look like a genuinely tolerant community of diverse individuals, perhaps an appropriate society for a heterodox free thinker like Hobbes to inhabit. But at the same time it is worth noting that while Hobbes was prepared to countenance extensive prudential toleration, this was only with the precondition that the beliefs so permitted are absolutely consistent with the persistence of the state. Looking at Hobbes' swingeing account in *Leviathan* of the subversive character of most standard Christian doctrine, it is hard to see that much substantial pluralism of the sort canvassed by contemporary toleration debates would have survived. Hobbes' society might be appropriate for him, but in fact it is a state designed only for Hobbists, and to that extent Hobbes' antipathy to the pluralist sectarian model is maintained. On that analysis it might be true to say that Hobbes' theory was not designed to foster toleration as such, and as it was (p. 621) commonly understood, but rather sought to eliminate, on the reductionist model, the substantive problem of toleration altogether.

## 26.5 John Locke and Toleration

John Locke's famous writings on toleration used to be taken to mark a watershed of sorts in the development of a purely philosophical British defence of toleration during the later seventeenth century. It is fairly easy to reject crude versions of this account, and in addition it has become customary to draw attention to the close conceptual similarities between Locke's arguments and those of other seventeenth-century toleration writers, indeed to the point where the exceptional character of Locke's argument can appear to vanish entirely. But it is perhaps worth arguing here that although there are close and undeniable similarities between Locke's writings and those of mid-century Baptists, Independents, and even reductionist latitudinarians (Marshall 1994, 2006), there is an important intellectual departure in Locke's toleration writings to do with the presuppositions and resulting shape of Locke's argument, which do entitle Lockean arguments to closer consideration as distinctively, if not exclusively, philosophical treatments of the question of toleration.

The nature of the change has much to do with the nature of Locke's presuppositions. The important distinction that makes a substantial difference to the character of the argument is that although his argument remains decisively theistic, Locke produces a theory of toleration which is not dependently Christian, and which does not rely upon exclusively Christian presuppositions. This change might seem to be fairly insignificant in the context of Locke's wider religious allegiances, but it does mark an important shift away from arguments resting upon distinctively Christian theological presuppositions derived primarily from scripture, and towards an approach to the problem of religious pluralism built up from a theistic natural law foundation. This was a shift which reflected a more generally held elite scepticism over the foundational capacities of



scripturally based theology. For this reason it is important not to overstate Locke's exceptionalism in a broader European context where natural law (in the hands of writers like Samuel Pufendorf, for example) was increasingly coming to inform political theory more generally. However, the combination of Locke's peculiar determination to establish clear modal foundations for human understanding, combined with his prolonged exposure to the peculiar problems of the English religious situation, coalesced to produce a very distinctive vision of how the problem of toleration might be (p. 622) addressed, one which can make some important claims to a more distinctively philosophical character.

The particular context for Locke's discussion was the restoration in the early 1660s of the church-state model as it had been understood in the earlier part of the century. Locke's earliest writings on the topic, in his unpublished *Tracts on Government* (1660), seem to put him squarely in the Hobbesian camp. His argument there, that the state had the right to impose religious forms and ceremonies that were *adiaphora* (matters indifferent that were not identifiably part of God's law) was clearly aimed against the tolerant claim that such things should be determined by the individual according to their conscience. But Locke's anxiety about authoritative claims of conscience in such matters did not mean that he favoured the further Hobbesian thought that the state was necessarily omniscient in all public matters of religion. This left too little room for individual religious liberty. The Hobbesian problem became particularly acute after the re-imposition of religious uniformity in 1662, government action that left a sizeable minority of essentially peaceable religious nonconformists at odds with the church state over matters of conscience.

When he was moved to consider this issue in his 1667 'Essay Concerning Toleration', Locke responded to the complexities of the problematic relationship between church and state with a characteristic ground-clearing exercise designed to establish in the first instance the nature and extent of the authority of the state when it came to matters of religion. It was an approach that deliberately eschewed controversial scriptural interpretation in favour of grounding the relevant boundaries of state authority upon God-given natural reason. As such, Locke derived an argument for toleration from non-Christian premises. If Locke's presuppositions supported the premise that 'the magistrate ought to do or meddle with nothing but barely in order to securing the civil peace & propriety of his subjects', this effectively meant that when it came to religious matters 'The magistrate hath no thing to do with the good of men's souls or their concerns in an other life' (Locke 2006: 281), in other words providing the basis for an extensive theory of toleration, barred only to groups (like Roman Catholics and Quakers) whose doctrines were widely held to have necessarily dangerous political consequences.

Locke's typically systematic approach to such distinctions would deepen and entrench over the following decades, frequently in reaction to the Hobbesian logic of the persecutory Anglican establishment. The 1670s manuscript note 'Excommunication' makes it clear that if the end of civil society is 'the preservation of the Society and every Member thereof', this lay in parallel with religious society, or that of the church, which aimed exclusively at 'attaining happiness after this life in another world' (Locke 2006: 327). Locke began to elaborate an account of the relationship between these modally distinct entities in his 1680 manuscript 'The Defence of Nonconformity', which was a response to Edward Stillingfleet's *Mischief of Separation* (1680), widely accused of Hobbism. Here, as Tim Stanton has shown, (p. 623) Locke made it clear that although states and churches were both products of natural reason and will, they were, crucially, categorically distinct voluntary associations, instituted by people for different ends (Stanton 2006). This account gave unambiguous expression to 'the view that the church should not impinge on civil life or vice versa', and thus (together with the reading of civil society secular ends in the 'Second Treatise') laid the essential foundations for the view of the relationship between states and churches that would inform his most famous work, the *Epistola de Tolerantia*, which would be published in 1689.

Locke's *Epistola* was written in Amsterdam at the end of 1685, one of many theoretical responses to Louis XIV's revocation of the Edict of Nantes, and also the resurgence of Catholicism in England in the wake of James II's accession to the throne. Locke's distinctive and evolving response to the British situation since the 1660s had led him to develop the conceptual materials which he now deployed in response to a European situation. The *Epistola*'s three main arguments emerged from Locke's guiding distinction between the ends and authority of states and churches. Firstly, Locke made it clear that neither God nor the consent of the people could commit the care of souls to the magistrate. Secondly, the magistrate's power consisted solely in outward force, whereas true religion involved the inward persuasion of the mind.

Given that force alone is incapable of altering the contents of the mind, then it was incapable of bringing people to true religion. Locke's third argument was that even if magisterial force could bring about such mind-altering results, the efficacy of such means would not necessarily bring more people to true religion: given the variety of religions subscribed to by different magistrates, there was no guarantee that the beliefs required by any particular magistrate were true.

These arguments attracted immediate and influential criticism, most notably from the Anglican clergyman Jonas Proast. Proast's critique is interesting not only because it has been taken up in modern criticism of Locke's work, but also because Locke's subsequent responses to Proast can help us to understand more accurately the philosophical drivers of Locke's theory. Although Proast (like most of his contemporaries) agreed with Locke that force could not bring about internal compliance, he made the case that it could nevertheless bring people to the truth 'indirectly and at a distance'; if this were true then Proast believed that the magistrate did have a role to play in the salvation of his subjects (Proast 1690: 5). Proast's thought that persecution might in fact work has been taken up in Jeremy Waldron's modern critique of the Lockean position, which takes this point to constitute a fatal flaw in the Lockean case for toleration, if this dimension of his argument is taken to be constitutive of his case (Waldron 1991). However, it is not clear that Locke felt that the possibility of effective compulsion detracted from the main thrust of his claims. He did not directly deny Proast's suggestion, precisely because the point of his argument was that even if compulsion *did* work, it was simply unnecessary and illegitimate (Stanton 2010: 263). Locke's jurisdictional case was complemented by his fallibilist assault upon Proast's idea that the magistrate (p. 624) might have a duty to impose what he believed to be the true religion. For Locke such claims lacked the epistemic authority that such action would require (Rogers 1992). In making his case against Proast, Locke deployed a powerful combination of the separatist case and the fallibilist argument to rule out the thought that the civil magistrate could have any remaining justification for the use of force in religious matters. These were arguments which conspired to underpin Locke's conclusion that religion was the business of churches and not the state. Churches were, as Locke argued, in accordance with his earlier response to Stillingfleet, 'voluntary Societ[ies] of Men, joining themselves together of their own accord, in order to the publick worshipping of God, in such a manner as they judge acceptable to him, and effectual to the Salvation of their Souls' (Locke 1689: 9). As products of human intellect and will, there could not be one true church, and all churches shared the same status because there was no common judge. Locke's view effectively implied the existence of a plurality of churches in the state, and the thought that the exercise of true religion implied mutual tolerance. Toleration was not, it should be noted, a civil right, and never could be, because religion was no part of the civil sphere.

Notoriously, for all of its theoretical sophistication, Locke's theory of toleration nevertheless retained traditionally familiar exclusions: Roman Catholics, atheists, the intolerant. But it is important to note that the exclusions are not simply arbitrary or the elaboration of contingent knee-jerk prejudice. Locke's exceptions are internally consistent with and driven by his theistic natural law approach to the problem. Atheists cannot be bound by divine obligations, and Roman Catholics bound to the Pope violate the natural distinctions between the political and the religious spheres (it's worth noting that Locke did not exclude Gallican Catholics). It is also a striking illustration of the distinctive character of Locke's theory that on theistic grounds Jews, Muslims, and theist pagans all qualify for inclusion.

## 26.6 Conclusion

Locke's theory in the *Epistola* offered perhaps the most decisively philosophical iteration of the British sectarian pluralist argument for toleration in the seventeenth century, and the development of his thought underlines some of the themes that this chapter has sought to highlight. British seventeenth-century tolerationist thought was not, in general, particularly original, but what does give it an important thematic unity is the fact that tolerationist writers were responding to a distinctive set of political and religious dilemmas emerging from the travails of a polity where political and religious authority were both problematically (p. 625) intertwined and subjected to a highly political process of dissolution and recombination. These problems gave rise to distinctive efforts to define the nature of the relationship between the civil and religious spheres, typically according to a comprehensive or sectarian logic, represented in the early part of the century by, for example, the



diverging positions of Chillingworth and Williams, and later by the stark contrast between Hobbes and Locke, positions which generated very different understandings of what the idea of toleration could mean. This process was certainly far from teleological in terms of generating recognizably tolerant outcomes: it would be a long time before mainstream toleration theory came close to the practical outcomes envisaged by the likes of William Walwyn. It was also not a process that owed much to secularization. The changes that we can observe in the structure of the arguments have nothing to do with abandoning a theological for a philosophical approach to the issues. What does change is that the predominantly Christian and scripturally driven approach to the questions is repositioned within a structure that for Locke, at least, relies upon a natural theological foundation, a transformation that does much to make Locke at least feel much more of a philosophical contemporary to us than Thomas Helwys or Leonard Busher. But this impression should not blind us to the fact that toleration as western liberals tend to understand it today is only with a certain amount of difficulty wrenched away from its theological presuppositions and applied in other contexts (see the work of De Roover and Balagangadhara 2008).

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## Notes:

(1) It is also worth noting that this position was not the exclusive preserve of sectarians on the extreme wings of Protestantism, particularly after the *de facto* disestablishment of the traditional Anglicanism in the 1640s. After this point, for obvious reasons, many Anglicans also started to pursue the separatist jurisdictional logic and proposing toleration arguments based upon the same premises.

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